MAR 2 0 1928

ANNUAL SESSIONS - 1928

California, Sacramento, April 30 - May 3—Nevada, Reno, September 21-22—American Medical Association, Minneapolis, June 11-15

Reduced Rate

CALIFORNIA AND WESTERN MEDICINE

Owned and Published Monthly by the California Medical Association

1016 BALBOA BUILDING, 593 MARKET STREET, SAN FRANCISCO

ACCREDITED REPRESENTATIVE OF THE CALIFORNIA, NEVADA AND UTAH MEDICAL ASSOCIATIONS

VOLUME XXVIII
NUMBER 3

MARCH · 1928

50 CENTS A COPY
$5.00 A YEAR

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VOLUME XXVIII MARCH, 1928 No. 3

IMMUNITY PHENOMENA IN TUBERCULOSIS—SOME CLINICAL ASPECTS*

By FREDERICK EBERSON, M. D.
San Francisco

DISCUSSION *by W. R. P. Clark, M. D., San Francisco; William C. Voorsanger, M. D., San Francisco; Chesley Bush, M. D., Livermore; Karl F. Meyer, Ph. D., San Francisco.*

PERHAPS it is truer for tuberculosis than for any other infectious disease that to react is to live or that to live is to react. One of our modern writers doubtless implied this when he said that to be absolutely still and unresponsive is a virtue only of the dead.

REACTION AND DEFENSE OF THE BODY

The different clinical manifestations of tuberculosis are outward expressions of complicated reactions taking place within the body. To what extent the tissues and their secretions play a part individually or collectively is a moot question. We have the humoral and the cellular schools of immunology with opposite points of view, but a middle ground between the two extremes would appear to be more nearly correct. Indeed our present-day knowledge of immunity phenomena tends to embrace the joint activities of both cells and cell products. An idea of the mechanism of tuberculous infection may be gained if we analyze the disease at its inception and trace its development through various stages and their attendant symptoms and signs. The course of the disease will be modified, however, depending upon whether we are dealing with a primary infection or a reinfection. The implantation of tubercle bacilli leads in either case to the formation of special structures in the cells and in the tissues. If the infection be a primary one the bodily response will depend upon native powers of resistance, and if secondary, upon the specific resistance or immunity developed by the first infection. Clinically these immunologic differences are seen in the well-defined types of pulmonary tuberculosis. In one fibrosis and proliferation with arrested disease occur, and in the other exudation, caseation and complete breaking down of tissue with the formation of cavities and generalized disease.

The contrast between primary infections and reinfections is sharply drawn anatomically, not only in the early stages but in the method of healing. In childhood we see a typical form of scarring, as pointed out by Puhl[14] in 1922. Calcification is always present along with a marked tendency to ossification. The initial lesion lies usually immediately beneath the pleura and may occur in any part of the lung, usually in the upper lobes. The area shows exudation and a rapidly caseating bronchopneumonic focus that is sharply delimited, and the related lymph nodes show caseous foci. Healing is characterized by the formation of granulation and scar tissue surrounded by a dense fibrous capsule. This chalky mass is gradually absorbed by invading connective tissue that builds typical bone.

Reinfections, however, may be multiple, occur chiefly in the apex of the lung, and are situated more frequently within the lung substance. Healing in this type of disease causes contraction of the surface of the lung. Such foci of reinfection, unlike those of a primary infection, show productive or proliferative changes, usually in the vicinity of a small lobular bronchus. In this unit of pulmonary tissue the tubercle bacillus becomes localized. Ultimately these foci caseate and calcify, but only rarely do they form bone. Characteristic of this type of infection is the freedom from involvement of the related lymph nodes. The primary infection heals completely in a great majority of people. In over 90 per cent of adults the scars of an early infection can be demonstrated. In a certain number of children and of young adults the primary lesion goes over into the stage of generalization or metastases. In such instances the process is manifested as a lymph node tuberculosis and not so much a pulmonary involvement.

SENSITIZATION PHENOMENA

At this stage of the disease we are presumably dealing with the so-called "anaphylactic" period. We see the well-known diffuse enlargement and caseation of the tracheobronchial lymph nodes involving not only those of the primary focus, but also the entire chain of hilus nodes. This picture has been described as scrofula, and is the type of tuberculosis in which caseation and softening of the lymph nodes may bring about a rapidly advancing type of aspiration pneumonia that is frequently the cause of death in children.

Concomitantly with the processes going on in the lung, metastases to other parts of the body may occur by way of the blood stream. The general picture of a reinfection in the anaphylactic or sensitization period includes clinical phenomena associated with involvement of the skin, middle ear, mucous membranes of the nose, mouth, pharynx, and cornea where phlyctenules, or vesicles, are often seen. The clinical aspect of this stage would appear to represent a violent reaction

* From the Department of Medicine, University of California Medical School, San Francisco.

* Read before the Section on Medicine, San Francisco County Medical Society, September 6, 1927.

of the previously sensitized body against an infection with the identical virus. One might enlarge upon this idea of immunity phenomena by extending the observations further to miliary tuberculosis, which is found in infancy and characterized by tubercles in all of the organs. It is believed by some that this type of infection has been used erroneously as an example of a remarkably rapid form of dissemination of the virus in the young subject. Inasmuch as the extraordinary blood invasion is accompanied by local reactions, a certain amount of immunity must have been developed. If this were not so the patient would die of tubercle sepsis. Reports of recovered cases of miliary tuberculosis have been generally doubted, yet in the light of pathologic and immunologic findings we should not be surprised to find a rapid dissemination through the blood stream of large masses of tubercle bacilli in a more or less markedly immunized body. It would seem that true disseminated tubercle formation ought to occur in proportion to the acquired resistance.

RESISTANCE TO TUBERCULOSIS INFECTION

Resistance to invasion by the tubercle bacillus is dependent upon the virulence of the bacillus, the susceptibility of the patient and his resistance. Susceptibility is determined by the constitution of the individual and his heredity. Evidence has been presented by Raymond Pearl[18] to show that there is, in the father's kinship, a definite tendency toward constitutional inferiority of the respiratory system, manifested chiefly in early adult life, in a lack of resistance to pulmonary tuberculosis. In the mother's kinship he has been able to show a lack of resistance to non-fatal respiratory infections such as bronchitis and bronchopneumonia in infancy and childhood. It is clear that in the children of such parents there will be an extremely low resistance to any sort of respiratory infection. It has been suggested recently that the "cautious young woman of the future will insist upon looking up the family history of her prospective husband, not to ascertain whether he can trace his lineage to the Mayflower, but to learn if there is in his family a constitutional tendency to weakness of the respiratory system or other organs."

Another side of the picture has been presented by the studies of the inheritance factor[1] in tuberculosis from an analysis of cases in persons giving a positive or a negative history of this disease in parents. Drolet[2] has adduced evidence of fundamental importance in this connection. It was found that exposure to tuberculosis was reported more frequently among the non-tuberculous patients than among those who were tuberculous. More than 30 per cent in a group of 2509 non-tuberculous persons gave a history of tuberculosis in one or both parents; whereas in a group of 2785 tuberculous patients only 14 per cent reported a parental history of infection. Among 5852 subjects with a negative history of tuberculosis in parents, 59 per cent were found to be tuberculous, whereas among 1577 persons with a positive parental history 34 per cent were tuberculous. Making due allowance for the smaller number of subjects in this last group, the difference none the less appeared striking enough to warrant the conclusion that the incidence of the disease was inversely proportional to the amount of parental infection. Further evidence showed a greater tendency to recovery in patients with tuberculous parents than in members of families attacked by the disease for the first time. Within recent years we have been observing an almost universal decline of tuberculosis in countries or communities where it was formerly epidemic. There is good reason to believe that the decreased incidence of the disease in racial stocks that have been exposed to city life and to tubercle infection has been due, in a measure, to an increasing immunity thus acquired.[3] Children of tuberculous parents do not inherit predisposition to the disease, but rather an increasing degree of immunity.

LATENCY IN TUBERCULOSIS

A sharp line of differentiation cannot be drawn between latency and immunity in tuberculosis. In common with syphilis, typhoid fever, malaria and diseases caused by trypanosomes, tuberculosis may become latent. By latency we mean that such a balance has been struck between the host and the parasite that an infection becomes dormant and the patient apparently well. There is an armed truce, so to speak, and the borderland between resisting and attacking forces may or may not yield to the advantage of the parasite. In such persons micro-organisms are present somewhere in the body; and these organisms, although wholly innocuous for the individual host, are potentially virulent and become actively so when transplanted to a suitable environment, which need not necessarily be another host.[4] Clinicians observing tuberculosis must be impressed by the fact that they do not often find a satisfactory correlation between the clinical perception of the initial tuberculous lesion and its anatomical and pathological significance. A lesion may remain latent for a long time and cause no apparent clinical symptoms. A disease that is seemingly clinically incipient has often already progressed far beyond the primary stage from the anatomical and pathological point of view.

Sight must not be lost of accidental factors in the sudden explosion of a tuberculous process. Physical strain, acute respiratory infections, and other causes may come at inopportune moments. If they come when a tubercle is well localized and healed they may be without effect, whereas at another time serious illness may result. This has been well shown in carrier conditions in animals as well as in patients. One of the best examples of the effect of added strain is the frequent death in mice from mouse typhoid following an infection with pneumococci. The bacillus which causes mouse typhoid assumes a latent or carrier state, but may be transformed into an active fatal infection by the mere introduction of some depressing influence from without, in this particular instance a pneumococcus. In the case of patients the bal-

ance between host and parasite is often broken by a superimposed disease or physical stress.

Clinical experience has given abundant evidence of the immunizing effect brought about by a primary infection with tuberculosis. Despite the great extent of such infection the number of persons with actual illness is remarkably low. There must be a natural resistance else we should all be sick. This observation has been borne out by the devastating effect of disease such as tuberculosis, malaria, or smallpox, when introduced among primitive peoples for the first time. One cannot assume, however, that there is a native immunity to tuberculosis, for, if exposed, all become infected and practically every human being reacts to tubercle formation. Such difference as does exist is in the mode of reaction in certain people and in the young as compared with adults.

The tubercle bacillus had celebrated its twentieth birthday anniversary when Sir William Osler[12] drew the famous parallel between tuberculous infection and the parable of the sower. Today, almost a quarter of a century since he wrote that, we may quote him and summarize the course of tuberculosis in terms of the soil and the conditions suitable for the growth of the organism in the body. *"Some seeds fell by the wayside and the fowls of the air came and devoured them up."* These are the bacilli scattered broadcast outside the body, an immense majority of which die. *"Some fell upon stony places."* These are the bacilli that find lodgment in many of us, perhaps, with a production of a small focus, but nothing comes of it. They wither away "because they have no root." *"Some fell among thorns, and the thorns sprang up and choked them."* This represents the cases of tuberculosis, latent or active, in which the seed finds the soil suitable and grows, but the conditions are not favorable, as the thorns, representing the protecting force of the body, get the better in the struggle. *"But others fell on good ground and sprang up and bare fruit an hundred fold."* This last is too obvious for comment.

MECHANISM OF RESISTANCE TO FIRST AND SUBSEQUENT INFECTIONS WITH TUBERCULOSIS IN THE EXPERIMENTAL ANIMAL

The immunity phenomena that are associated with various clinical manifestations of tuberculosis may be studied in the experimental animal. The effects of first and subsequent infections may be clearly seen when experimental inoculations are made within the skin or in the cornea. The early anatomical response of the tissues of a susceptible animal inoculated for the first time is unlike that seen when reinfection is practiced. In the first instance a well-circumscribed nodular tubercle will develop slowly after a week or more, without any of the signs of inflammation. Only later, after three or more weeks, does redness appear around the tubercle, associated with changes that are indicative of a progressive lesion. At this stage the animal has become allergic, that is to say, it begins to react in a new way because of the changes set up in the body by the tubercle bacilli. The susceptibility of the animal has been altered. If such an animal now receives an intracutaneous inoculation of tubercle bacilli the response by the tissues is rapid and local inflammation occurs. Instead of proliferation that is well localized we observe a diffuse exudation. The inflammation occurs rapidly and subsides as rapidly, and the nodular tubercle now present retrogresses and may disappear completely. All of these changes, be it remembered, are contingent upon moderate dosage of tubercle bacilli.

It is obvious that a similar set of conditions in the human is accompanied by a corresponding sequence of clinical events. With an understanding of the difference in the mechanism in the examples cited, it is possible to envisage more clearly the clinical picture of the disease.

INFORMATION GIVEN BY TUBERCULIN REACTIONS

An important aid in the study of these conditions in the human is found in skin tests made with products of the tubercle bacillus. While the mechanism of tuberculin reactions is not understood very clearly, it has been stated that such reactions indicate a focus of tuberculosis somewhere in the body. It has been thought for many years that a positive tuberculin test presupposes tubercle infection and does not occur unless there is present a specific allergy or hypersensitivity to the infection. Recently, however, it has been shown[5, 6] that such hypersusceptibility to tuberculin products can be developed artificially and, under certain conditions, will give rise to a definitely positive tuberculin test even in the absence of tuberculosis. Furthermore, normal animals made allergic in this way react to an injection of tubercle bacilli in a manner identical with that seen in cases of reinfection with tuberculosis. With this as a point of departure, it is noteworthy that the bacillary element, which is another way of describing tuberculin, is capable of sensitizing the normal animal body. This may be construed as heterodoxy or worse by certain workers in the field of tuberculosis. However, the newer results have been based on careful studies of fundamental principles of immunology tested rigorously in many hundreds of subjects. That these new tuberculin derivatives have superior diagnostic value seems to be well established, moreover, by clinical and laboratory tests. Although these observations[7, 8] tend to confute known facts concerning ordinary tuberculins, it is well to seek the causes for the discrepancies in the type of substances used and in the technique of their preparation. Without giving a detailed description of these new materials, it is significant that they have been prepared from non-protein synthetic culture media and represent specific substances produced by tubercle cultures. It is not strange that these fractions of tuberculin prepared and purified by new methods should behave differently from ordinary old tuberculins. These represent an unknown mixture of non-specific substances from the bacilli and culture media, and which, as a whole, cannot be standardized. It is clear that, although a complex mixture may be of little value in the study of

immunity phenomena by skin tests, certain derivatives may be important and differ individually as components. If one may take a simple analogy, it is known, for example, that water, containing as it does hydrogen and oxygen in combination, will quench fire (and thirst, perhaps), but what are we to say regarding hydrogen and oxygen themselves?

THE VALUE OF TUBERCULIN TESTS IN CONTACT AND NON-CONTACT CHILDREN

In general, it is clear that a tuberculin reaction does signify allergy in a clinical sense. When taken in conjunction with positive clinical findings and a definite history of exposure to tuberculosis, a positive skin test with tuberculin gives us information of some value. There are some who maintain that a positive test is fraught with dire significance, and others who believe that the test means nothing. Again, if we take the middle ground, we arrive at a more reasonable interpretation of facts. Combined with thorough clinical study and evaluation of all the clinical and laboratory data, tuberculin tests, when made with a suitable substance, can be so correlated as to give a definite answer to the question regarding a positive or a negative diagnosis. Diagnostic techniques have been known to fail signally, not because the test itself is worthless, but because those who make use of it fail to appreciate its limitations. At some time in the future we may be able to say more definitely that a certain set of symptoms and signs means tuberculosis in childhood. Today all of the classic symptoms suffer from the need of careful evaluation and interpretation.

If the tuberculin test is to mean something definite in the study of tuberculosis, a difference should be noted in the number of reactors or non-reactors in groups of children who are known to be contacts and in those who are non-contacts. A study of the literature on the subject suggests that the non-contact groups have been inadequately selected because the age of the patient has usually not precluded exposure to tuberculous infection. It is only in an age group in which the subjects can be rigidly observed at home or in an institution that certain variables that are most likely to vitiate a clinical experiment may be controlled. The consensus seems to be that contacts give a higher percentage of positive tuberculin reactions than do non-contacts. Recently studies by Green and Forbes[11] have shown that 64.5 per cent of contacts gave positive tests, whereas 19.4 per cent of non-contacts were positive. In another study by Friedman[10] 53.6 per cent of contacts and 23.2 per cent of non-contacts were found positive to tuberculin. Still another article by Slater[15] in 1924 indicated that, among the contacts studied, 81 per cent as against 5.3 per cent of non-contacts gave positive tuberculin reactions. Allowing for the error in classification of strict non-contacts, these figures are what one would expect to find if the tuberculin substances measured the reactivity of a patient in terms of a specific bacillary element.

RÔLE OF TOXINS IN TUBERCULOSIS

Our knowledge of immunity phenomena in tuberculosis has been based primarily on the conception of bodily defenses against the bacillus. It is questionable if this resistance ought to be considered as antibacterial only. Clinically, tuberculosis is a toxemia, and it is reasonable to suppose that an immunity toward the disease would be antitoxic as well as antibacterial. At least our efforts toward combating the infection might well be guided by such a possibility.

Accordingly, in the experimental studies, attempts have been made to identify toxic substances in the blood serum of tuberculous patients and animals and in cultures of tubercle bacilli. The results suggest that there is a toxin wholly unlike tuberculin or the bacillary element, and that this toxic substance can be neutralized by artificially prepared antitoxic serum. These deductions are based on tests made in patients and animals, using both skin tests and a biological method in guinea-pigs, which enables one to recognize the immediate effects of the toxin and its neutralization. Further studies show that different clinical pictures of tuberculosis can be correlated with the results of skin tests made with toxin filtrates of cultures of tubercle bacilli. Both toxin content and susceptibility to infection can thus be measured in exposed or non-exposed persons and in patients showing different stages of the disease. In general, the method makes possible the differentiation of degrees of allergy, immunity, actual tuberculous disease, and susceptibility.[7 8 9]

LOCAL ALLERGIC AND IMMUNE REACTIONS TO TUBERCULOSIS IN ANIMALS TREATED WITH TUBERCULIN FRACTIONS AND TOXIN FILTRATES

Having noted the differences between a primary infection and a reinfection with tubercle bacilli in the experimental animal, it is possible to compare these with the sequence of events in animals previously treated with toxic filtrates and tuberculin fractions injected alone or in combination. If allergy and specific resistance to tubercle infection can be developed artificially with such materials, then a subsequent inoculation of tubercle bacilli should be followed by the reactions that are characteristic of a reinfection in a previously tuberculized animal. Such was found to be the case in the experiments. Normal guinea-pigs thus treated and inoculated into the skin with tubercle bacilli showed a prompt local reaction, an early development of nodule in an inflammatory zone, a lesion that came rapidly to a standstill and later tended to retrogress and heal. It was observed also that the regional lymph nodes did not show the rapid and pronounced enlargement peculiar to untreated control animals. In this instance early localization and focal involvement were accomplished in exactly the same manner as that caused by a previous inoculation with tubercle bacilli. However, when guinea-pigs had been previously injected with inactivated toxin filtrate the animals

behaved like untreated controls. In these the immediate reaction was absent, the nodule developed on an uninflamed background in one to two weeks; the lesion after this time advanced rapidly and approximated the condition seen in reinfected tuberculous animals at the time of reinoculation, and there was a later tendency to progression with softening and caseation. In all respects, regarding the local, regional and constitutional reactions as seen in the different groups of animals, the results justified the conclusion that the allergy phenomena were correlated with the development of specific resistance or immunity. Histopathologic studies confirmed the clinical findings.[8]

CONCLUSIONS

The immunity phenomena in tuberculosis seem to give an adequate explanation for the various clinical aspects of the disease. An understanding of these phenomena ought to guide our future investigations. From present knowledge the most promising leads suggest that attention might well be directed to phases of investigation related to a combined antitoxic and antibacterial immunity. Too much emphasis cannot be laid upon the importance of correlating experimental laboratory investigations with clinical data so that the results may become intelligible and give a broader understanding of the problem as a whole. From the point of view of ordinary present-day treatment the immunologic factors should serve as guides. Certainly a fibrotic, productive form of pulmonary tuberculosis must be managed differently from that of an exudative type.

As newer methods of study and treatment are developed, we are bound to meet with opposition not only on the part of our colleagues who are skeptical, perhaps healthily so or otherwise, but also from the laity who are usually misinformed. Objections are not always well founded, however, and we may run afoul of an obstacle similar to one recently reported by the health department of New Jersey in connection with the Schick test. An indignant mother wrote that she refused positively to permit either of her boys to take the Schick test. She had read the book and seen the play, and she did not approve of them.

University of California Hospital.

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DISCUSSION

W. R. P. Clark, M. D. (516 Sutter Street, San Francisco)—I have been very much interested in the work Doctor Eberson is doing with fractions of tuberculin, particularly from the standpoint of the diagnosis of early active tuberculosis. At the present time the diagnosis of early active tuberculosis in the child is most difficult to make, and the present tuberculin reactions do not help us very much. A negative reaction is of more importance than a positive, for a positive reaction does not differentiate between active, latent or healed tuberculosis. Doctor Eberson believes that these fractions react only to a substance in the body produced by active tuberculosis and not to latent or healed lesions. If this be true this work is of inestimable value, and every effort should be made by those interested in tuberculosis to aid Doctor Eberson in this research work.

❋

William C. Voorsanger, M. D. (490 Post Street, San Francisco)—Doctor Eberson is to be greatly commended for his splendid effort in attempting to correlate laboratory and clinical findings. He forces us again to ask the question, what is tuberculin? Of course we know it is the product of the tubercle bacillus, but it is complex in nature, and Doctor Eberson may succeed in dividing it into its numerous component parts, thus giving us an index to either diagnosis or prognosis. It is not too much, perhaps, to hope that one toxin of the tubercle bacillus may prove to be more virulent than another. Clinically we already have demonstrated that certain types of tuberculosis are curative, that certain lesions wall off or absorb, that certain cavities disappear and, on the other hand, certain types will not improve. Doctor Eberson may be able to prove this observation, since he states that "both toxin content and susceptibility to infection can thus be measured in exposed or non-exposed persons and in patients showing different stages of the disease."

Doctor Eberson's reference to the inheritance factor in tuberculosis is interesting. If 30 per cent of a non-tuberculous group gave a history of tuberculosis in one or both parents and only 14 per cent of a tuberculous group, then rightly "incidence of the disease is inversely proportionate to the amount of parental infection." But if this observation is true, then our tuberculin tests showing a larger percentage positive in contacts than in non-contacts cannot be considered as indicating present or future active tuberculosis. Clinically we believe that the child of tuberculous parents has just as much chance of acquiring an immunity to tuberculosis as of becoming actively tuberculous.

The splendid results of Calmette and his associates in the immunization of children of tuberculous patients may be partly due to a natural immunity already acquired. In treating adult tuberculosis we see certain types yielding readily to almost any form of treatment. We say this is due to the resistance of the patient, or we say technically that the patient is generating enough antibodies. Doctor Eberson raises the question as to whether this phenomenon is antibacterial or antitoxic. Personally I believe it is antibacterial. I hope he can prove it is antitoxic. If the latter proves to be true we may yet find a toxin or antitoxin with therapeutic value. For the past forty-five years this question has engaged the best brains and laboratories of the world. We seem no nearer a solution than when Koch announced the discovery of his original tuberculin. Is it surprising therefore that many of us have lost hope in the possibility of any product of the

tubercle bacillus curing its own clinical manifestations and have gone over to the biochemical school, which believes that some simple extract or chemical will some day be discovered with definite specific properties against tuberculosis?

In the meantime the work of Doctor Eberson should be encouraged and supported because he seems to be attacking a very complicated subject in an intelligible manner, showing that clinical aspects of disease and "immunity phenomena" can be reconciled and explained.

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CHESLEY BUSH, M. D. (Arroyo Sanatorium, Livermore)—We have been intensely interested in Doctor Eberson's work. Its first phase has been the standardization of tuberculin. Recent tests of various commercial tuberculins show that they vary in potency considerably. We may also presume that tuberculins made at different times by the same manufacturer may vary. Just what is the content of a gram of Koch's O. T. of commercial tuberculin? This variation in tuberculins is largely overlooked by clinical men who write on the tuberculin reaction.

We have noted in our work that tuberculin sensitivity varies from time to time—that children who react negatively to 0.1 mgms. of Koch's O. T. used intracutaneously may later react positively to the same dose, particularly if their general condition is improved. We have always used the same brand of tuberculin. Austrian recently pointed out that sensitization to tuberculin may vary considerably over a long period of time. Eberson's tuberculin, because of better standardization, may throw considerable light on our interpretations of the tuberculin reaction. Recently we have had the opportunity of using Eberson's tuberculin simultaneously with our usual commercial tuberculin, and have noted differences in the reaction which may have considerable meaning.

The other phases of Doctor Eberson's work are revolutionary. He states that he can sensitize animals without infection, and he believes that he has demonstrated a tubercle toxin. We hope that further work will substantiate this. If so, there will be no limit to the possibilities that the future may have in store for a specific treatment of tuberculosis. We believe that this work should undergo an intensive investigation by all available facilities to substantiate a tremendously important "lead" in research work on tuberculosis.

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KARL F. MEYER, Ph. D. (Hooper Foundation for Medical Research, San Francisco)—Doctor Eberson has reviewed from a clinical point of view the most recent contributions to the study of tuberculosis. His presentation clearly shows the complexity of the problem which still confronts us. There are many phases which could be discussed, but I will confine myself in my remarks to the question of the virulence of the tubercle bacillus and the nature of the immunity reactions. It is generally believed that the tubercle bacillus possesses a constant virulence. (This term is used with all the restrictions which have been placed upon it by Topley.) However, many years ago I worked with a human strain isolated from an abdominal lymph node. By passing it through twenty-four series of guinea-pigs it exhibited a constant and extraordinary virulence. Guinea-pigs inoculated subcutaneously died regularly within eighteen to twenty-two days. A somewhat similar observation has recently been reported by Silberschmidt, who studied for a period of three and a half years a human strain of tubercle bacilli through sixty-seven passages. The guinea-pigs injected with the strain invariably succumbed within twelve to fourteen days. Silberschmidt's strain was not only virulent for guinea-pigs, but also for mice and rabbits on intravenous and intraperitoneal injection. In my opinion these observations indicate that the virulence or the invasive properties of the tubercle bacillus may be a variable factor. Aside from the well-known differences in susceptibility of the host it is always worth while to consider the virulence of the tubercle bacillus and to conduct virulence tests much more frequently than has been done in the past. The nature of the tuberculin reaction is still under consideration. It is probably not an anaphylactic phenomenon although a protein-like substance acts as the inciting factor. There is every indication that the union of this protein-like substance with the tuberculous tissue liberates a toxin which is responsible for the febrile and the focal reactions. *If the same toxin is produced in the culture tube, still remains an open question although the experiments of Doctor Eberson would indicate such a product had been produced.* The immunity against tuberculosis is generally considered to be cellular, and it would be most interesting if humoral factors could be demonstrated. Leukocytes do not digest tubercle bacilli since they possess no lipases; but they transport the organisms to tissues where they can be handled. If any toxin production occurs it must be in these areas and their antitoxin content should be high. A number of interesting laboratory experiments suggest themselves.

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DOCTOR EBERSON (closing)—In closing, it might be emphasized that the experimental immunologic points brought out in this paper are really not so revolutionary as some of the discussions have intimated. Not infrequently the most revolutionary discoveries are not at all revolutionary, but merely reinterpretations of old and well-known facts that have hitherto lacked proper emphasis because of failure to correlate the observed facts.

The clinical and laboratory investigations that have been hinted at here, support, I believe, a rational conception of the phenomena of tuberculous disease in terms of immunology against a background of diverse clinical pictures. Clinical trial on a comprehensive scale has shown, moreover, that although complicated chemical analyses of the tubercle bacillus or tuberculins may have some theoretical interest, the best test of a diagnostic agent is the clinical test. In my experience a certain preparation of tuberculin and a toxic filtrate of the tubercle bacillus have given results that appear to be of clinical value not only as definite information, but also as leads for further research. These are the facts obtained by clinical and laboratory experiment, and as such they are presented.

Referring specifically to Doctor Voorsanger's comment on antitoxic and antibacterial immunity in tuberculosis, I feel that one ought not exclude any one of these factors. Indeed the major part is probably played by antitoxic substances insofar as antibacterial resistance or any type of bodily immunity is definitely checkmated, if not entirely nullified, in the presence of a tuberculous toxemia.

EXERCISES FOR SCHOOL CHILDREN WITH HEART DISEASE*

By SVEN LOKRANTZ, M. D.
Los Angeles

THERE are about eight thousand children with heart defects attending the Los Angeles city schools. What has been done? What can be done? What should be done for these children? These and similar questions are constantly coming up before the Health and Corrective Physical Education Department of the Los Angeles city schools which has charge of the preventive work and medical supervision of these children.

A classification of these children has been made throughout the schools with more or less routine and accuracy. The grouping is as follows:

GROUP 1—*Children with Functional Disturbances*—These children are permitted to take part in athletics, with the exception of strenuous activities and competitive games.

GROUP 2—*Children with Minor Lesions*—These chil-

* Read before the Pediatric Section, California Medical Association, at its Fifty-Sixth Annual Session, April 25-28, 1927.

dren take part in limited and specified athletic events and corrective games.

GROUP 3—*Children with Organic Heart Lesions, Well Compensated*—These children are assigned to corrective classes only. They may also take part in corrective games. Rest is also prescribed by physicians.

GROUP 4—*Children with Organic Heart Lesions Where Compensation Is Poor*—Rest is the major program for these children.

The Group 1 children with the functional disturbance, have their athletic activities supervised and checked by the school physician. They cannot take part, for example, in competitive races, basketball, football, or baseball.

The Group 2 children with the minor lesions are allowed by the school physician to take part in certain exercises in which no extra strain is put on the heart and where the games are very carefully supervised. For example: golf and certain formal exercises. These children are also given special exercises in the corrective gymnasiums. Exercises are given them that will tend to enlarge their chest capacity and indirectly strengthen the heart muscles.

The Group 3 children with definite organic lesions, well compensated, are assigned to the corrective physical education classes. They also take part in corrective games.

All exercises given the children vary in degree and amount of exertion. The exercise groups are divided into different sections: (1) the passive; (2) the active; (3) the imaginary passive; (4) the imaginary active; (5) the imaginary assistive; (6) the imaginary resistive; (7) second and third degree active. For example, a child with minor lesions might be given second and third degree active exercises whereas a child with organic lesions might be given first degree active exercises, resistive and passive exercises.

To the children of Group 4, with organic lesions where compensation is poor, only passive and assistive exercises are given, with rest before and after.

Exercise tolerance tests are given once a week in a few schools to test the effect of the exercises. The vital capacity and the pulse is taken to check the improvement in the chest capacity and the pulmonary circulation. Special care is taken that only those exercises are given that will improve the circulation in the veins and improve respiration, thereby decreasing the work of the heart and increasing the amount of oxygen intake.

All exercises, if within a certain limit, tend to exercise the muscle of the heart in a reflex way. Any movement which will in any way interfere with respiration or circulation in the veins is avoided. For instance, hangings, active trunk rolling, forward-lying raising, and sit-lying raising. Chest lifting and respiratory exercises are first to be given in any schedules designed to strengthen the heart muscle.

Herewith are given as examples four schedules, each one assigned to the four groups previously referred to.

GROUP 1—FOR CHILDREN WITH FUNCTIONAL DISTURBANCES

1. Stride standing, arm carrying forward, upward and forward or sideward, downward, three times.
2. Stride standing, arm rolling, two times.
3. Stride standing, head rolling, three times.
4. Deep knee bending, once.
5. Neck firm, side bending, right and left, three times.
6. Hip firm, trunk twisting, right and left, three times.
7. Stride standing, shoulder rotation, deep breathing, three times.
8. Rest on back.

Schedule of exercises to be repeated every day.
Exercise tolerance test, once a week.

GROUP 2—FOR CHILDREN WITH MINOR HEART LESIONS

1. Stride standing, arm carrying forward, upward and forward or sideward, downward, three times.
2. Hip firm, trunk rolling in a small circle, three times.
3. Hip firm, knee flexion and extension, once, half knee bending.
4. Stride standing, forearm flexion and extension, seven times.
5. Stride standing, arm flying, slow speed, three times.
6. Arm forward bending, arm stretching sideward and deep breathing, return.
7. Arm carrying forward, upward and forward or sideward, downward, three times.
8. Rest on back before and after for ten minutes.

Exercise tolerance test, once a week.

GROUP 3—FOR CHILDREN WITH ORGANIC LESIONS WELL COMPENSATED

1. Rest on back fifteen minutes.
2. Lying, arm carrying forward, upward and forward or sideward downward, seven times with deep breathing, imaginary resistive.
3. Lying, knee separation and closing, imaginary resistive.
4. Sitting, arm rolling, three times.
5. Sitting, double arm flexion and extension with deep breathing.
6. Sitting, head rolling, three times.
7. Sitting, arm carrying forward and backward, three times.
8. Standing, hip firm, side bending right and left, three times.
9. Arm carrying forward, upward and outward, seven times with deep breathing.
10. Rest on back ten minutes.

Exercise tolerance test, once a week.

GROUP 4—FOR CHILDREN WITH ORGANIC LESIONS WITH POOR COMPENSATION

1. Rest on back fifteen minutes.
2. Lying arm carrying forward, upward sideward, and downward, slowly, with deep breathing, four times.
3. Sitting, chest lifting.
4. Lying, forearm flexion and extension with deep breathing, imaginary assistive.
5. Lying, deep breathing (with air in motion, temperature not over 66 degrees Fahrenheit).
6. Rest on back twenty minutes.

The heart may also be stimulated and strengthened by tapotement of the back, which should be done under a physician's supervision. A light general massage will assist the venous flow and might be done by parents under a physician's directions. However, there are heart conditions where mas-

sage should not be given; for instance, those with much dyspnea, angina pectoris, etc.

The purpose of the corrective exercises and rest periods is not to direct the child's medical treatment, but to outline a protective and preventive regimen with regard to physical development. The heart muscle can be exercised with due care in the same way as any other muscle in the body. Medical treatment is left altogether to the discretion of the family physician or the clinic doctor. All questionable heart diseases in children are passed upon by the consulting medical board.

There are eight members of this consulting board who meet once a week to aid in diagnosis and outlining the preventive regimen with regard to general hygiene and nutrition, insofar as these concern the relation of children to the school work. The board does not direct a child's medical treatment in any way. By this plan great benefit can be accomplished, not only to the child, but also for the school department. The consulting board aims to provide that no child with heart disease shall have its heart reserve taxed or broken. This board also passes upon bulletins which give information as to the general hygiene and the activities of these children in school and at home. It has at its disposal a central place for meeting, sufficient equipment, two stenographers, one social worker, and, by way of instruments, x-ray and fluoroscope, and one cardiograph. It also has the cooperation of the school nurses, school physicians, corrective teachers, private physicians, and parents.

Eight years ago I made a special investigation dealing with the influence of worry and excitement on school children suffering with heart disease, and I found that in such children there is a certain amount of nervous instability. They are extremely sensitive to the remarks of the teacher and their fellow students. Although I have no definite statistics, I found that children with heart defects are injured by school work when teachers are too strict. In such cases leniency is now shown and the child is asked the first question so that the worry of expectancy is avoided.

Arrangements have been made in the city schools of Los Angeles that children suffering with heart disease may come late to class. Sometimes the rest periods are very short, and it would be difficult for them to reach the classroom without hurry. In most schools they are given an opportunity for rest in the middle of the day, upon the recommendation of the family doctor, the school doctor, or the consulting board.

In regard to foci of infection, provision for eradication of foci has been made, through inspections by school doctors and nurses, who report findings to the parents, to be transmitted to the family physician.

For the past eight years an attempt has been made to work out some definite regimen for the protection and prevention of heart defects among the school children of Los Angeles, yet the work is still in its beginning. There is much room for improvement in order to place it on a more scientific basis. It is aimed that this preventive regimen should not interfere in any way with the private physician's medical supervision of the child. From a physical point of view, Los Angeles schools are probably doing more for the prevention and general hygiene of school children with heart disease than is done in most other cities. Los Angeles, however, has no classified educational cardiac classes. I have not enough information to know whether or not such classes should be recommended.

Today many communities in America are beginning to realize the need of special plans for the education of children suffering from heart disease. However, since communities differ greatly, various and flexible methods to be used in meeting human and social problems are needed. The solution of the problem of the education and preventive care for children suffering from heart disease requires the cooperation of the child, the parent, the doctor, and the teacher.

358 South Citrus Avenue.

DISCUSSION

HENRY LISSNER, M. D. (318 West Ninth Street, Los Angeles)—Attention was called to the benefit to be derived by exercise in heart conditions by Schott of Nauheim and Thorne in America. Those investigators gave very valuable indications for controlling the amount of exercise to be allowed individuals with heart trouble; and they were probably the first with their "resistance movements" to call attention to the value of exercise in heart disease.

Doctor Lokrantz has carried out the idea of properly regulated, supervised and controlled exercise in school children with heart disease even further than the original methods advocated by Schott.

Intimate knowledge of the results of his system of exercises, and his grouping of heart disease into the four definite classifications has convinced me that his methods work to the great advantage of the patients. It insures and prevents the overexercising of hearts which could not stand the tax of undue strain, either in the form of so-called ordinary gymnasium work or in the more strenuous demands made upon them in competitive athletics such as track, football.

Obviously a careful physical examination is necessary in order to place a suspected heart into any of the four classes enumerated. It is also very essential to adjust the child to its new method of living as indicated by the necessities of each individual. The psychological attitude of the child toward its new life is one of the most important difficulties with which we have to contend. Taking a boy with an overtaxed heart out of the football or track team in which he is a star and making him understand that what you are doing is necessary for his future well-being and development in order to secure his cooperation, requires more tact and diplomacy sometimes than one is called upon to use in settling the affairs of state or nation.

Exercise alone is not the only prerequisite for the rehabilitation of an injured heart muscle. With it one must have the advantages offered by a well-trained social service, and dietetic department. These agencies look after the patient from an entirely different angle and aid in keeping him informed that he has an obligation to himself to fulfill, and they act as an intermediary between the individual and the heart center. It makes for an easier follow-up system, in which the benefits of progress become apparent or the need for change is suggested.

In heart cases other than those in which there is a school problem involved, the same classification and

exercises may apply, and the factors of family environment and nutrition are just as important.

Let us not raise our voice in praise of indiscriminate exercise for the heart sufferer; but rather let us keep in mind the patient's need and advocate the particular exercise fitted to the individual heart lesion, and then control their administration.

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WILLIAM J. KERR, M. D. (University of California Medical School, San Francisco)—It has been of great interest to learn of the work which is being done in the Los Angeles public schools for the cardiac cripple. The cardiac clinic of the schools, which has been well organized to follow up those who are found to be suffering from cardiac disturbances, has had a most progressive program and it is showing results. The care of children with various disturbances into groups which may be more rationally handled is a step in the right direction.

It is my feeling that children who fall into Group 1 are probably not suffering from true cardiac disease and that many of the disturbances are connected with the sympathetic nervous system or the central nervous system. In this particular group it is just as necessary to shield from nervous strain and emotional disturbances as it is to protect the children from the standpoint of the heart. I also believe that in many other cardiac conditions the nervous system plays quite a rôle in the production of some of the symptoms. The use of graded exercises for those who are suffering from actual cardiac disease and those who have a poor general circulatory tone is of undoubted value.

While there are some who hesitate to segregate children who have cardiac diseases, and single them out from the remainder of the students, I have no doubt that we may prolong the lives of many children by handling them in a proper manner. I doubt, however, the advisability of having special classes for cardiac cripples because it would mean more or less a duplication of the entire educational system. The entire percentage of those who have cardiac disease is so small in the entire school that it would be economically unsound to go to such an extreme in their care. However, leeway may be given them wherever possible, in the arrangement of courses and situation of classrooms, and with certain allowances for tardiness at classes.

It is very gratifying to see the way that Doctor Lokrantz has developed his plan for taking care of the cardiac cripple in all directions, and I am sure much has already been accomplished in the community by this cooperative work.

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DOCTOR LOKRANTZ (closing)—I am very pleased to know that both Doctor Lissner and Doctor Kerr are in favor of a school health program for children with heart disease. I fully realize that our program in Los Angeles needs further adjustment and should be placed on a more scientific basis. I also fully accept and realize the importance of the point that Doctor Lissner brought up, namely, that exercise alone is not the only prerequisite in rehabilitation of an injured heart muscle.

I was interested to get Doctor Kerr's reaction in reference to special educational classes for cardiac cripples. This has been tried out in the schools of New York, but was discontinued for various reasons.

It is my intention to freely consult with the Advisory Heart Board of the Board of Education before taking any further steps in the preventive program for children with heart disease in the city schools of Los Angeles.

INDICATION FOR BLOOD TRANSFUSIONS*

By LEROY BROOKS, M. D.
San Francisco

DISCUSSION *by Walter V. Brem, M. D., Los Angeles; John Francis Cowan, M. D., San Francisco.*

THIS paper is presented with the hope of stimulating a discussion which will result in the more frequent use of blood transfusions. Time will not permit a discussion on this occasion of the details of the many indications.

In the writer's opinion there is a lack of appreciation by some members of the profession of the results obtained by the judicious use of blood. There are others who are unduly afraid of transfusion because they have seen or heard of some untoward reaction. Practically all such reactions are due to poor technique either in the grouping and cross-agglutination tests, or in making the transfer of blood from the donor to the recipient.

PRELIMINARY SAFEGUARDS

Before doing a transfusion, with the possible exception of an extreme emergency (when a universal donor may be used), both patient and donor should be grouped, using fresh serum that has been properly preserved and not more than six weeks old. The cross-agglutination test should be done in addition, as one test checks the other, and too much precaution cannot be exercised in selecting a donor.

In spite of all tests having been properly done there will be reactions in rare instances, but the reactions that are due to incompatibility occur immediately upon the giving of a few cc. of blood, and if caution is exercised the injection can be stopped before harm is done. In over seven hundred transfusions, I have had only four alarming reactions: two in which hemolysis occurred, one urticaria, and one anaphylactoid reaction, probably caused by using a donor who had been used for the same patient about three weeks previously. The reactions with hemolysis both occurred in the same patient—a Type 2, and the blood was compatible according to grouping and cross-agglutination tests.

All my transfusions have been of unmodified blood by a technique which was published in this journal, January, 1926. If chemicals are added to the blood to prevent coagulation, or if too much time is allowed to elapse between the collecting and injecting of whole blood, more reactions will occur. Blood in the first stages of coagulation is toxic even though still unclotted.

In order to be correctly understood I wish to state that the rise of one or two degrees of temperature on the day of or on the day following a transfusion is not considered a harmful reaction. I have observed no chills of the type which could be considered dangerous, even to a patient in the most critical condition. In a few instances the patients have complained of feeling chilly. I have not noted a single chill of the type which causes

* Read before the Fifty-Sixth Annual Session of the California Medical Association, Section on Surgery, April 25-28, 1927.

a rattling of the teeth, shaking of the bed, or which requires hot water bottles and more covers. As a preventive, we make an effort to eliminate the psychic element of suggestion by never speaking to, or in the presence of, the patient, of the possibility of a chill following the transfusion. We believe the absence of chills and harmful reactions have been due to rigid attention to the details of the laboratory tests in selecting donors and the rapidity with which the blood has been transferred from donor to patient.

SOME INDICATIONS FOR TRANSFUSIONS

In massive hemorrhages that cannot be stopped by mechanical means, one not infrequently is confronted with the objection by physicians that transfusion raises the blood pressure and causes further or worse bleeding. This objection is not valid because the blood pressure is raised but little by transfusion, and the increase in coagulability of the blood more than offsets the rise in pressure—to say nothing of the value to the patient's tissues by the replenishing of the lost blood.

Generally speaking, any patient with secondary anemia having hemoglobin of 40 per cent or lower will be given a better chance of recovery if transfused. In medical patients one might find exceptions to this statement, as in certain of the blood dyscrasias. The acute leukemias are not benefited and sometimes probably harmed by transfusion. The chronic forms may be benefited temporarily or may need transfusion to prepare for forced surgery or to check hemorrhage after a needed operation. Hemophiliacs are benefited temporarily only, but transfusion makes continuation of life possible. Patients with Hodgkin's disease are benefited only temporarily by transfusion. On the other hand transfusion of 100 to 200 cc. whole blood is specific for hemorrhage in the newborn; sometimes more than one transfusion is needed, but I have never seen a case in which the bleeding could not be stopped. Transfusion with splenectomy is a cure for chronic purpura and good results follow the giving of whole blood in acute purpuras.

The primary anemias may be divided into two groups as to whether transfusion is or is not indicated. In the case in which symptoms of cord changes, etc., dominate the picture, transfusions are ill-advised. But certainly the patients in whom anemia is the predominant symptom, are made more comfortable by transfusion. If used, the hemoglobin should be kept up to 60 per cent as a minimum in order that the patient may live as an animal, and not simply exist as a vegetable. I believe better results are obtained by the transfusion of at least 500 cc. each time than by the more frequent transfusion of smaller amounts.

One of the most valuable procedures at the command of the pediatrician is transfusion. The results obtained in inanition, malnutrition, in secondary anemia from causes such as chronic gastro-intestinal infections, diarrheas, are just short of miraculous. Good results are obtained also with secondary anemia in chronic bronchitis and pneumonias, especially of the unresolved type. The results which I have seen from transfusion in acute blood-stream infections of the fulminating type where anemia was not present have been disappointing. In intestinal obstruction or in burns where toxemia threatens to overcome the patient, lives may be saved by removing as much toxin as is possible from the gastro-intestinal tract or from the area of burned tissue by surgical measures, following this by bleeding the patient almost to depletion and transfusing an equal volume of fresh blood. Obviously the problem here is a different one from that encountered in an acute fulminating septicemia. In the two examples just cited the body develops no antibodies, and the excess toxin is simply removed; while in septicemia the source of supply of toxin cannot be controlled, and to bleed the patient may only remove valuable specific antibodies.

In secondary anemia, both in adults and in children, following septicemia, mastoiditis, sinus infections, osteomyelitis, peritonitis, empyema, lung abscess, etc., the results are most gratifying. Many of these patients even after they have overcome the severity of the infection have little or no appetite, little strength and in general are doing badly. By transfusion their convalescence is shortened, complications are fewer, and the recovery made more certain.

The material for observation furnished by the World War demonstrated beyond all question that blood has no rival fluid in the treatment of shock. All other fluids quickly pass through the injured walls of the capillaries. It has been authoritatively stated that thousands of lives could have been saved if sufficient blood for transfusion had been available, not alone for patients with shock, but for those suffering from chronic infections as well.

In civil practice the greatest usefulness for transfusion is found in preoperative preparation of patients and postoperative treatment of chronic infections. Many patients who must be operated upon are lost following surgery, and of such many could be saved were blood transfused before or after operation, or sometimes both. The greater the number of transfusions one does in surgical patients the more is this fact appreciated. This is especially true when dealing with people past middle life, with such operations as resection of rectum or stomach, hysterectomy, prostatectomy, toxic goiter, chest surgery, etc. In this class of patients one should not necessarily be guided by the degree of anemia as an indication for the giving of blood. If before operation, after all tests and examinations have been completed, and there is a doubtful surgical risk, a transfusion should be done before operation and a donor selected for another transfusion after the operation, if necessary. As has been said, "No one dare any longer defend himself for operating upon an anemic patient without transfusion."

In conclusion I wish to emphasize again that for such enthusiasm for blood transfusion to be justified, every possible precaution must be exercised in selecting donors and unmodified blood

must be transferred with dispatch by one of the well-standardized techniques of whole blood transfusion.

490 Post Street.

DISCUSSION

WALTER V. BREM, M. D. (523 West Sixth Street, Los Angeles)—The transfusions of blood, made safe by the work of Jansky and Moss, is one of the most important additions during the present century to our therapeutic armamentarium. After acute hemorrhage it is often life-saving, and more frequently it hastens and makes safe posthemorrhagic convalescence. In the treatment of chronic secondary anemias it is likewise very helpful, and in the prevention and treatment of postoperative shock. We have not had great success in the treatment of blood dyscrasias, though there is frequently temporary benefit. Since the introduction of liver diet in the treatment of pernicious anemia, its use in that disease will be much limited hereafter. Our results in infectious diseases, except in combating anemia, have not been encouraging. It is specific in the treatment of hemorrhage of the newborn.

We agree with Doctor Brooks in that the whole untreated blood should be transfused, and that the method should involve as little handling as possible. We ourselves have used a slightly modified Lindemann syringe method in over four thousand transfusions, and have found it very satisfactory.

Doctor Brooks rightly calls attention to the extreme care that should be exercised in grouping bloods, as the group reactions are very alarming and dangerous. Anaphylactoid reactions are rare, but do occur occasionally. We do not believe that they are the result of previous transfusions, even with the same donor. The ordinary febrile reaction, with or without chill, is rather common, having occurred in about 10 per cent of our transfusions. However, we have included as reactions temperature rises of one degree accompanied by slight malaise. Most of these reactions are inconsequential; they do not interfere with the beneficial results or cause great discomfort to the patient. Occasionally, however, the reaction is severe, and might be dangerous in the case of a very sick patient. The severe reactions are most apt to occur in febrile cases.

We have known no way to avoid these reactions, but recently we found that the use of fasting donors prevented them in a patient who had had repeated severe reactions previously. The donors fasted overnight and were used before they had eaten breakfast. Probably a non-protein meal would not be contraindicated. The case referred to will be reported soon in the *American Journal of the Medical Sciences.*

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JOHN F. COWAN, M. D. (490 Post Street, San Francisco)—Blood transfusion has become a very definite surgical practice, and has an established place in the treatment of certain medical and surgical diseases.

It has been my privilege to see the development of blood transfusion from the tedious method of direct vessel suture, through the use of the cannula, and syringes to the Kimpton tube and other modern methods. By this slow development its technical difficulties have been overcome.

Yet, as Doctor Brooks points out, there are certain and very important precautions to be observed in blood transfusion.

Too much caution cannot be exercised in the selection of a donor.

Transfusion without grouping is a dangerous procedure, while with modern methods it is safe and simple. If the bloods are not tested and found compatible, there is a 30 per cent risk of hemolysis occurring in the recipient and the reaction may prove fatal in about 5 per cent. It is generally believed that persons belonging to Group IV (Moss) are universal donors and that their red cells are not agglutinated or hemolyzed by the serum of any other group. It is now known that this statement is not reliable, and that the only safe method of selecting a donor is to test the blood against the recipient in addition to grouping. This is particularly true when dealing with primary blood diseases, as pernicious anemia. In these cases the bloods should be checked by all known methods before each transfusion.

A person with pernicious anemia may not react to transfusion at one time, but many have a very serious reaction at a later transfusion with blood from the same donor. I believe that reactions are due to errors in technique in the majority of instances. In the use of whole blood, rapidity of transfusion is of the utmost importance, for, as Doctor Brooks points out, blood in the first stages of coagulation is toxic even though it is still unclotted.

In the citrate method most of the reactions are due to the use of impure citrate.

If one uses chemically pure citrate, freshly prepared and used within twenty-four hours, reaction will practically never occur.

The reaction following the citrate method is comparable to the reaction following the administration of intravenous glucose solution. With the use of buffer solution, which neutralizes any free lactic acid present, our reactions have disappeared.

Personally I prefer the use of whole blood.

In my experience the results of transfusion in cases of severe primary hemorrhage have been most satisfactory.

In a case of subfacial hematoma of the thigh in a hemophiliac the bleeding ceased after one transfusion.

In secondary hemorrhage, due to gastric and duodenal ulcers, the condition of patients has been greatly improved by transfusion, and the administration of 500 cc. of whole blood has not been followed by recurrence of bleeding.

I have not had any permanent beneficial results in cases of septicemia.

In practically all abdominal cases in which the hemoglobin is 35 per cent or lower, I give preoperative transfusion.

If transfusion is indicated I believe that it should be done before operation.

If postoperative transfusion is considered in a patient who has had ether anesthesia, the patient should be given intravenous glucose solution until all ether has been eliminated.

With modern methods of blood testing and grouping, and with the rapid administration of whole blood, the mortality following major operations has been greatly reduced.

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DOCTOR BROOKS (closing)—I wish to thank Doctors Brem and Cowan for their discussion.

I want to emphasize again the great value of transfusion in major surgery for the doubtful risk. Since I am equipped to give transfusions without much difficulty I have noticed that I give them in the doubtful risks more frequently than formerly. When one is in doubt as to whether or not a transfusion should be given it is better to give it. There is no other procedure known to me which is as valuable in keeping the mortality rate low in general surgery, and I am convinced that it is not used frequently enough.

Yates and Raine of Milwaukee recently did some experimental work which showed that the oxygen-carrying power of the blood in a given patient is decreased from 10 to 25 per cent following anesthesia. This inefficiency in the oxygen-carrying power of the blood develops between one and twenty-four hours after the anesthesia. The return to normal requires from five to ten days. This is possibly one of the reasons why such remarkably good results follow transfusions after major surgical procedures in patients who are only slightly anemic. The difference in the mortality rate with and without transfusions in doubtful cases is very striking.

There are reports in the literature that the group of an individual changes following certain diets, following anesthesias, etc. Personally I do not believe that the groups ever change; in infancy they are often

not well established, but once established, I have never had the experience of having the group change. I believe the explanation of such changes will be found in errors in the laboratory work from inactive sera or imperfect technique. I frequently give transfusions immediately following operations for patients who are still unconscious from the anesthetic and have never experienced untoward effects. As a precaution, however, before each transfusion, the grouping of both the patient and the donor, as well as the cross-agglutination tests, is carried out.

CORONARY ARTERY DISEASE—AN ELECTRO-CARDIOGRAPHIC STUDY*

By P. BERMAN, M. D.
AND
V. R. MASON, M. D.
Los Angeles

DISCUSSION *by James B. Herrick, M. D., Chicago; William J. Kerr, M. D., San Francisco.*

CORONARY artery disease, because of its historical interest and its relation to angina pectoris, has been the subject of numerous reports throughout a long period of years. The older textbooks of medicine, published since the time of Jenner, John Hunter, and Heberden, have all contained eloquent descriptions of the major symptoms of angina of the chest. The more recent articles of Herrick[1,2] and Benson,[3] and the monographs of Mackenzie[5] and Allbutt,[4] have presented in detail the historical, clinical and pathological aspects of coronary artery obstruction and occlusion. Largely dependent on the clinical observations of American physicians the symptomatology of coronary artery disease has been so clearly defined that the diagnosis is now made and confirmed with considerable frequency.

THE CARDIOGRAM IN DIAGNOSIS

The aid brought by the electrocardiogram in the diagnosis of coronary artery disease is of recent date. Eppinger and Rothberger[6] first published records made by the hearts of dogs in which the muscle at the base of the left ventricle had been injured by the injection of a solution of silver nitrate. Smith,[7] a short time later, produced remarkable electrocardiograms in dogs by ligation of branches of the left coronary artery. Subsequently Pardee[8,9] published electrocardiograms made during an attack of angina pectoris and assumed that in his patient injury of the wall of the left ventricle by occlusion of a coronary artery caused the peculiar form of the electrocardiogram. The tracings published by each of these observers have essential characteristics of striking resemblance. In a recent report Pardee[9] adequately correlated and described these abnormal electrocardiograms and gave the name "coronary T wave" to the peculiar alteration of the terminal ventricular complex often associated with the coronary artery disease.

Willius[10] some years ago, in a purely statistical study, pointed out the grave prognosis associated with significant inversion of the T wave. Although he did not differentiate between simple inversion of the T wave and the characteristic coronary wave described by Pardee, he did state his belief that significant inversion of the terminal ventricular complex was produced, in all probability, by vascular degeneration of the obliterative type with involvement of the heart muscle. We may assume, therefore, that both significant inversion of the T wave and the peculiar coronary T wave are, in all probability, produced by myocardial derangements or degenerations dependent on occlusion of large or small branches of the coronary arteries or on varying degrees of obstruction of these arteries. In a minimal number of instances localized myocardial damage might result from other causes than vascular lesions, but except when experimentally produced, few such cases have been reported.

We have been interested in the specificity of the coronary T wave as described by Pardee, and for this study we have chosen all electrocardiograms which have shown a downward, sharply peaked T wave with an upward convexity of the S-T or R-T interval in all or any leads except lead III alone. When characteristic and marked in lead III alone, we are convinced of its serious significance if associated with other evidence of myocardial damage, but our post-mortem material is as yet too scanty to be used as evidence,

* From the Medical Service of the Los Angeles General Hospital.

TABLE 1—*Eight Cases. Diagnosis of Occlusion of Coronary Artery made Before Death*

Name	Age	Sex	Blood Pressure	Heart Size	Symptoms	Electro Cardiogram	Wa R	Autopsy
L. D.....	48	F		Normal	Vomiting, shock and pain for two days.	See Fig. 4	0	Occlusion of left coronary. Infarction of myocardium.
C. H.....	69	M	150/70	Enlarged	Pain, vomiting, dyspnea, shock.	See Fig. 2	0	Occlusion of left coronary. Infarction of myocardium.
H. H.....	82	M		480 Gms.	Pain, heart failure.	Typical	0	Mural thrombos of left ventricle with embolism of left coronary.
H. E.....	59	M	110/76	3.9-10.6 Orthodiagram	Pain, dyspnea.	See Fig. 3	0	Thrombosis left coronary.
G. B.....	49	M	252/144	Large	Pain, dyspnea, heart failure.	Typical	0	Thrombosis left coronary.
F. W.....	40	F	190/90	8.6 10.8	No pain. Gradual heart failure. Aortic insufficiency.	Typical	0	Occlusion of left coronary.
W. P.....	66	M		Enlarged	Two attacks of angina with death in last one.	See Fig. 1	0	Old and fresh myocardial infarction. Left coronary occlusion.
E. M.....	72	F	158/90	Large	Frequent anginal pain.	See Fig. 6	0	Occlusion of left coronary artery.

Note—In all figures abscissael measure 10-4 volts and ordinates 0.04 seconds.

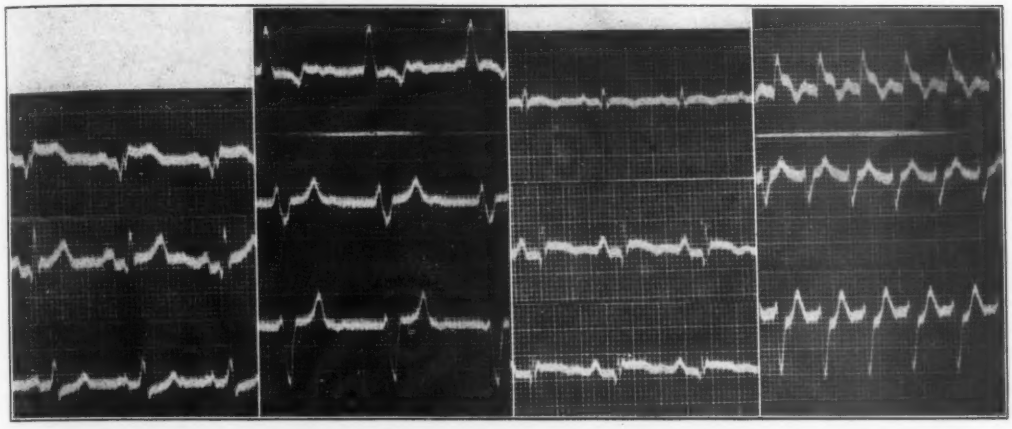

Fig. 1 Fig. 2 Fig. 3 Fig. 4

Figs. 1, 2, 3, and 4. Electrocardiograms taken during fatal attacks of angina pectoris. At autopsy an infarction of the myocardium from occlusion of a branch of the left coronary artery was found in each case. These figures show the characteristic changes of the T wave in recent infarctions.

and such instances were therefore not included in this report.

GROUPING OF THE ELECTROCARDIOGRAM STUDIES

The electrocardiograms were selected from approximately a thousand made at the Los Angeles General Hospital during the past year. They were then correlated with the clinical records in each instance and with the post-mortem studies in those cases which came to autopsy.

Statistics compiled in this way are of no value in demonstrating the interesting relationship between coronary artery disease and angina pectoris or heart failure. They are of value, we believe, in demonstrating the diagnostic value of the coronary T wave of the electrocardiogram.

The completed records fell readily into four groups, which will be discussed *seriatim*.

Group I: This group consists of eight patients in whom the diagnosis of occlusion of a coronary artery was made before death by clinical and electrocardiographic study and was confirmed by postmortem examination. In each instance the electrocardiogram (Figs. 1, 2, 3, 4), showed the

TABLE 2—*Eighteen Cases. Electrocardiograms, Histories, and Clinical Studies, All Compatible with Coronary Artery Disease Diagnosis*

Name	Age	Sex	Blood Pressure	Heart Size	Symptoms	Wassermann	Electrocardiogram
D. C.	65	F	212/110	Enlarged	Dyspnea. Edema; attacks of dizziness.	0	Fig. 5.
M. W.	59	M		Very large	Typical anginal attacks. Heart failure. Edema.	0	Broad Q. R. S. with slurring; coronary T leads I and II.
W. W.	58	M	110/84	8 - 13	Dyspnea; sudden attacks of weakness and tightness of chest.	0	Abnormal Q. R. S.; atrial fibrillation. Coronary T leads I, II, III.
F. P.	53	M	120/80	Normal	Attacks of angina for ten years.	0	Left ventricular preponderance abnormal Q. R. S. Coronary T leads III and T.
J. S.	50	F	155/100	Normal?	Frequent dizzy spells.	0	Left ventricular preponderance coronary T leads T, II.
T. B.	70	M	130/100	7 - 12	Marked cardiac asthma with anginal attacks.	0	Abnormal Q. R. S. Coronary T leads I and II.
L. L.	71	M	170/100	6.9 8.7	Anginal pain for many years.	0	Coronary T wave. Leads T. Very light upright T in lead III.
J. W.	41	F	110/78	5.4 7	Anginal pain.	0	See Fig. 7.
J. T.	64	M	136/80	5.3 13.8	Anginal pain.	0	Coronary T leads I and II.
A. S.	40	M	160/100	5.6 12.2	Anginal attack with pericardial friction. Death.	0	Coronary T leads I and II.
J. A.	54	F	250/130	Large	Attacks of weakness.	0	Coronary T leads I and II. Atrial fibrillation.
H. B.	52	M	212/150	Large	Anginal pain.	0	Coronary T leads I and II. Left ventricular preponderance.
M. H.	55	M	142/90	Large	Many anginal attacks.	0	Coronary T leads I and II; very high upright T in lead III.
M. S.	63	F	180/100	4.7 10.3	Many anginal attacks.	0	Coronary T leads I and II. Left ventricular preponderance.
N. G.	31	F	90/60	Normal	Attacks of breathlessness.	0	Coronary T leads II and III.
R. F.	54	F	200/100	Large	Anginal pain.	0	Coronary T leads I and II. Left ventricular preponderance.
G. S.	60	M	100/75	7.4 - 13.9	Many sudden attacks of dyspnea.	0	Coronary T leads II and I. Very high upright T in lead III. Left ventricular preponderance.
C. K.	63	M		Large	Many anginal attacks.	0	Coronary T leads II and I. Very high upright T in lead III. Left ventricular preponderance.

characteristic abnormalities first described by Pardee in occlusion of a coronary artery in man. These patients all suffered from anginal pain (Table 1), and some had had numerous attacks of precordial pain. One patient was studied in two severe attacks of pain, and at autopsy a healed and a recent infarction of the left ventricle was found. Another patient with a history of a severe anginal attack previously was found to have an old mural thrombus in the left ventricle over an infarction and a recent embolism of the left coronary artery by a clot which probably arose from the old thrombus.

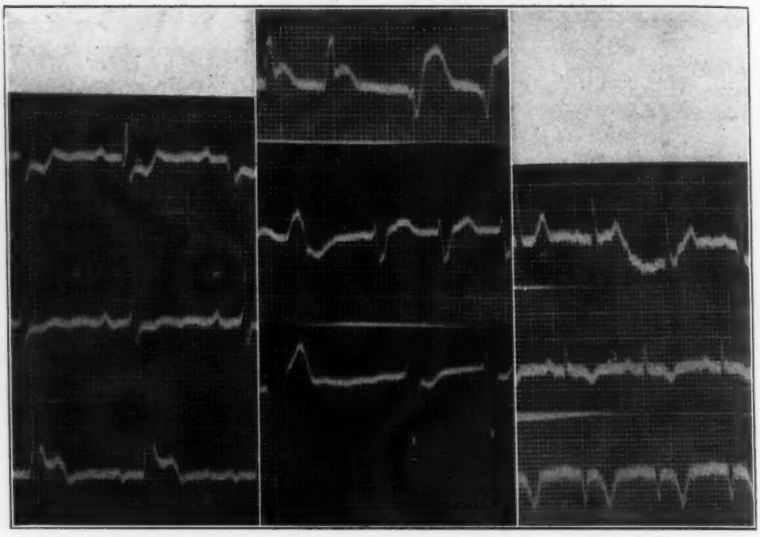

Fig. 5 Fig. 6 Fig. 7

Figs. 5, 6, and 7. Electrocardiograms taken during attacks of angina pectoris which were not fatal.

As is usual in each case the left coronary artery or one of its branches was occluded.

It is of interest that during an equal period of time thirteen patients, who had not had electrocardiograms made, died of occlusion of a coronary artery, unrecognized clinically, but demonstrated at postmortem examination. Among these was a second example of embolism of a coronary artery from a mural thrombus of the left ventricle.

Group II: We have placed in this group eighteen patients whose electrocardiograms were characteristic of coronary artery disease and whose histories and clinical studies were compatible with that diagnosis. Eight of these were females (Table 2). All of the members of this group presented evidence of grave heart disease. The majority complained of attacks of severe precordial distress usually associated with symptoms of heart failure. In the remainder, attacks of dizziness, weakness and breathlessness were considered to be the equivalent of actual pain. The electrocardiograms in this group (Figs. 5, 6, 7), in addition to coronary T waves, usually presented other evidences of grave myocardial damage, such as bending, broadening and slurring of the Q. R. S. complexes, left ventricular preponderance or bundle-branch block.

Group III: This group consists of nine patients with syphilis, syphilitic aortitis, and aortic insufficiency. All were males with positive Wassermann reactions except one whose blood Wassermann had been positive. The youngest was 38 and the oldest 68 years of age (Table 3). All but three had had attacks of anginal pain. All of these patients showed characteristic coronary T waves (Figs. 8, 9, 10), and all but one showed marked left ventricular preponderance by electrocardiogram. In a footnote to one of his articles Pardee mentions the occurrence of the coronary T wave in one instance of syphilitic aortic insufficiency,

TABLE 3—*Nine Cases. Syphilis, Syphilitic Aortitis, and Aortic Insufficiency Existing*

Name	Age	Sex	Blood Pressure		Heart Size	Symptoms	Wassermann	Electrocardiogram
S. C.	68	M	170/100	4.9	12.7	Aortic insufficiency. Anginal pain.	Positive	Coronary T leads I and II. Left ventricular preponderance.
W. S.	55	M	165/40	4.2	11.2	Aortic insufficiency. Anginal pain.	Positive	Coronary T leads I and II. Left ventricular preponderance.
A. V.	48	M	154/34	9	12	Aortic insufficiency. Aneurysm of arch. Sudden death.	Positive	Coronary T leads I and II. Left ventricular preponderance.
J. J.	43	M		4.2	11.3	Breathlessness in attacks. Aortic insufficiency.	Positive	Coronary T leads I and II. Left ventricular preponderance.
F. R.	47	M	140/60	3.9	11.8	Aortic insufficiency. No pain.	Positive	Fig. 8.
J. M.	39	M		Very large		Anginal attack. Aortic insufficiency.	Positive	Fig. 9.
J. E.	48	M	150/0	4.5	12.6	Anginal attack. Aortic insufficiency.	Positive	Fig. 10.
R. C.	48	M	130/50	7	12	Anginal attacks. Aortic insufficiency.	Positive	Coronary T leads I and II. Left ventricular preponderance.
R. G.	38	M	130/0	4.2	9.6	Severe anginal attacks. Aortic insufficiency. Has had positive Wassermann.	0	Coronary T leads II and III. Left ventricular preponderance.

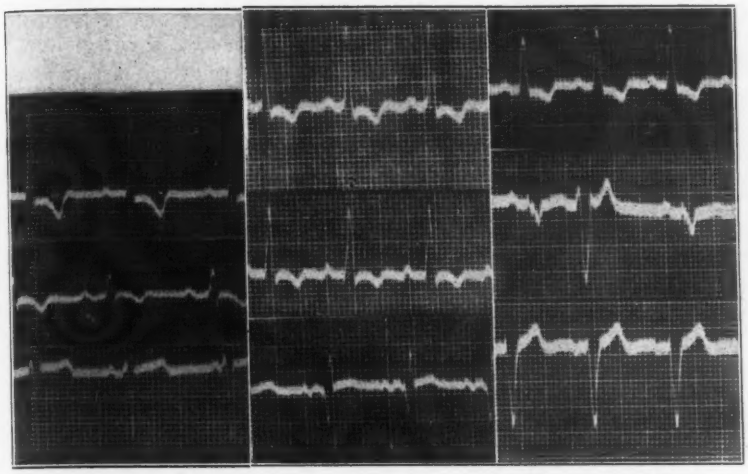

Fig. 8 Fig. 9 Fig. 10

Figs. 8, 9, and 10. Electrocardiograms from patients with syphilitic aortitis and aortic regurgitation showing coronary T waves and left ventricular preponderance.

but aside from that we have found no reference to it in the literature. The part played by coronary artery disease in the symptomatology of syphilitic aortitis is well known and the presence of the coronary T wave in a certain proportion of cases was to be expected.

Group IV: This group consists of nineteen patients of great importance in the study of the specificity of the coronary T wave. In each instance the electrocardiogram showed the characteristic coronary T wave, but clinical studies of the patient had not led us to suspect coronary artery disease (Table 4). We are aware that only postmortem examinations can prove, ultimately, the presence or absence of structural myocardial damage in the area irrigated by the left coronary artery in these patients.

CASE REPORTS

A summary of a few of the clinical records will be given:

Case 1—J. H., 24-495. The patient, a male aged 60, was admitted to the hospital, comatose, with temperature of 104 degrees F. He had marked arteriosclerosis. The heart was said to be normal. The blood pressure was 185/120. Death occurred in a few hours. The electrocardiogram (Fig. 11) showed the abnormalities associated with coronary artery occlusion.

Case 2—J. F., 262-338. A male, aged 52 years, was admitted for gangrene of the right toe, due to a circulatory disturbance thought to be thromboangitis obliterans. The heart was apparently normal. The electrocardiogram (Fig. 12) showed the changes associated with coronary artery obstruction.

Case 3—C. G., 32-807. A boy, aged 19, was examined on account of asthmatic attacks occurring every three to four months. The heart seemed to be normal. The electrocardiogram is shown in Fig. 13.

Case 4—A. T., 257-039. A male, aged 23 years, was

Table 4—*Nineteen Cases. Coronary Artery Disease in Doubt from Clinical Studies, with Electrocardiograms more Positive*

Name	Age	Sex	Blood Pressure	Heart Size	Symptoms	Wassermann	Electrocardiogram
H. B.	17	M	115/0	4.2 11.9	Severe anginal pain with breathlessness. Aortic and mitral endocarditis.	0	Coronary T in all leads.
L. K.	22	F	Normal	5.4 9.8	Severe anginal pain. Probably an embolus of coronary artery. Double mitral lesion. Death.	0	Figs. 17, 18, 19.
L. S.	18	F	Normal	Large	Acute febrile condition. White blood cells 16,000. Anginal pain. Probably a coronary embolism from double mitral lesion.	0	Fig. 16.
M. V.	24	F	Normal	5.1-8.6	Purpura fulminans. Death following hours of severe precordial pain.	0	Fig. 15.
L. S.	30	M	170/0	5.9-7.4	Acute endocarditis with aortic insufficiency. Severe precordial pain.	0	Coronary T leads II and III. Left ventricular preponderance.
N. M.	53	F	220/120	Large	Marked arteriosclerosis with dementia.	0	Coronary T leads I. Atrial fibrillation. Left ventricular preponderance.
L. M.	52	F	154/100	Normal	Diabetes mellitus. Diabetic gangrene.	0	Coronary T leads I. Intraventricular block.
R. K.	47	F	142/90	Normal	Diabetes Mellitus.	0	Coronary T in all leads.
H. B.	60	F		Normal	Myoma uteri.	0	Coronary T leads I and II.
A. T.	23	M	140/40	5-11	Severe anginal attacks. Aortic insufficiency. Double mitral lesion. Fever of short duration.	0	Fig. 14.
E. B.	30	F	120/60	Normal	Pernicious anemia.	0	Coronary T leads II and III.
C. G.	19	M	110/60	Normal	Asthmatic attacks every two or three months.	0	Fig. 13.
N. T.	60	F	160/110	Large	Diabetes mellitus.	0	Coronary T leads I and II. Very high upright T leads III.
J. W.	41	M	230/100	6.5 10.5	Heart failure.	0	Coronary T leads I and II.
D. H.	38	M	180/110	Normal	Chronic Brights disease.	0	Coronary T leads I and II.
J. O.	50	F	240/140	4.1 10.3	Arteriosclerosis.	0	Coronary T all leads.
J. F.	52	M		Normal	Gangrene of foot.	0	Fig. 12.
J. P.	63	M	150/110	6.5 11.3	Attacks of dyspnea.	0	Coronary T leads I, II, III.
J. H.	60	M	185/120	Large	Entered hospital in coma with fever; death.	x	Fig. 11.

admitted. Had fever and pain under the sternum and radiating into the left shoulder. He had a double mitral lesion, an aortic insufficiency and a pericardial friction rub was heard near the apex of the heart. All symptoms disappeared in a few days. The electrocardiogram (Fig. 14) showed a characteristic coronary T wave in each lead.

CASE 5—M. V., 259-007. A young woman, aged 24 years, entered the hospital with symptoms and signs of fulminating purpura hemorrhagica of two weeks' duration. She developed severe precordial pain, breathlessness and fever, and died in coma a few hours later. The electrocardiogram (Fig. 15) was taken shortly after precordial symptoms developed and showed a coronary T wave in all leads.

CASE 6—L. S., 253-627. A girl, 18 years old, was admitted on account of breathlessness and severe pain over the front of the left side of the chest. She had fever and a leukocytosis of 16,000. The heart was enlarged. There was a double mitral lesion and râles at each base. Her symptoms disappeared rapidly. Two months later, however, she complained that any unusual exertion was followed by severe precordial pain. Her electrocardiogram (Fig. 16) was characteristic of coronary artery disease.

CASE 7—L. K., 252-163. A woman, aged 22 years, was under observation for many weeks for grave heart failure. She had a double mitral valve lesion. She suddenly developed severe precordial pain and a pericardial friction rub at the apex of the heart. An electrocardiogram (Fig. 17) showed the curves of a coronary artery occlusion. Fig. 18 was made three days later and Fig. 19 six weeks later; shortly before death.

These abstracts are offered as evidence that in this group of patients coronary artery disease, or embolism of the coronary artery (Cases 4, 6), or hemorrhage into the myocardium or epicardium (Case 5) were probably causal factors in the abnormal electrical response of the left ventricle which produced the coronary T wave in the electrocardiogram.

COMMENT

The clinical and electrocardiographic records of these fifty-four patients are presented as additional evidence of the value of the coronary T wave in the diagnosis of coronary artery disease. In each instance in which post-mortem studies were made of a heart which had produced this wave, occlusion of the left coronary artery or one of its branches was found. Eight examples of this type were observed and placed in Group I.

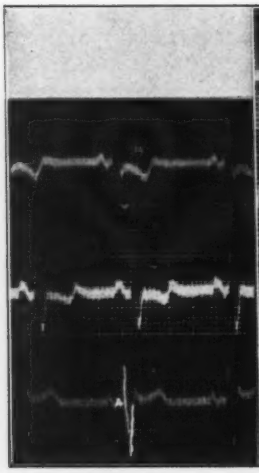

Fig. 11—Case Report 1

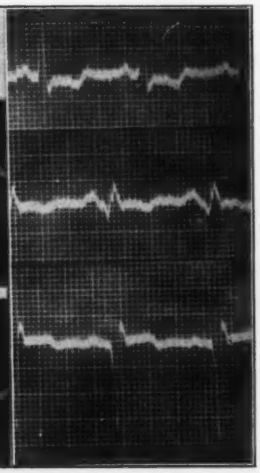

Fig. 12—Case Report 2

The presence of coronary artery disease in the twenty-seven members of Group II and Group III may be accepted with considerable certainty. These patients, as a rule, had anginal attacks and grave cardiovascular disease. Nine of the number had syphilitic aortitis and aortic insufficiency, and coronary artery disease under such circumstances is the rule.

Group IV consists of nineteen patients in whom coronary artery disease was not suspected until the presence of coronary T waves was observed in the electrocardiograms. Five of these patients were young individuals with valvular lesions of endocarditis and each complained of precordial pain. In these cases damage of the left ventricular muscle or of the left coronary artery by an inflammatory process or infarction of the muscle following embolism might easily have occurred. We have recently seen a fatal coronary artery thrombosis from a small inflammatory lesion in an otherwise healthy coronary artery. One patient in this group had a fulminating purpura hemorrhagica and developed severe precordial pain shortly before death. The remainder were past middle life. Several were diabetics with vascular degeneration and the others presented clinical evidence of cardiovascular disease. Anatomical proof of lesions of the left coronary artery or of degeneration from any cause of the area of the left ventricle supplied by this artery is absent in this group. Clinical and electrocardiographic evidence, however, practically prove the presence of a lesion of the left ventricular wall.

INTERPRETATION OF ILLUSTRATIONS

The illustrations in this article show the coronary T wave better perhaps than it can be described. In the examples of acute occlusion of a coronary artery the S-T or R-T interval, normally at the isoelectric line, may begin high up on the descending limb of the R wave. This feature is nearly constant in recent infarctions of the wall of the left ventricle. Later the commoner type of coronary T wave makes its appearance. With satisfactory clinical improvement even this abnormality may become less marked after weeks or months. Pardee believes that the type of T wave which appears at the time of infarction is probably produced by the reaction to the anemia of the heart muscle, while the coronary T wave may be dependent on the reaction of repair about the anemic area. We have seen a typical coronary T wave from a young person with pernicious anemia and also from a dying human heart just before the onset of ventricular fibrillation. It seems probable, therefore, that the abnormal electrocardiograms are the result of structural muscular damage from inadequate oxygen supply. That this condition is usually caused by obstruction or occlusion of an artery with subsequent temporary or permanent damage of ventricular muscle has been repeatedly demonstrated. The shape of the electrocardiogram is dependent, however, on the result of injury involving a certain area of the heart as demonstrated by Smith[7] and Eppinger and Roth-

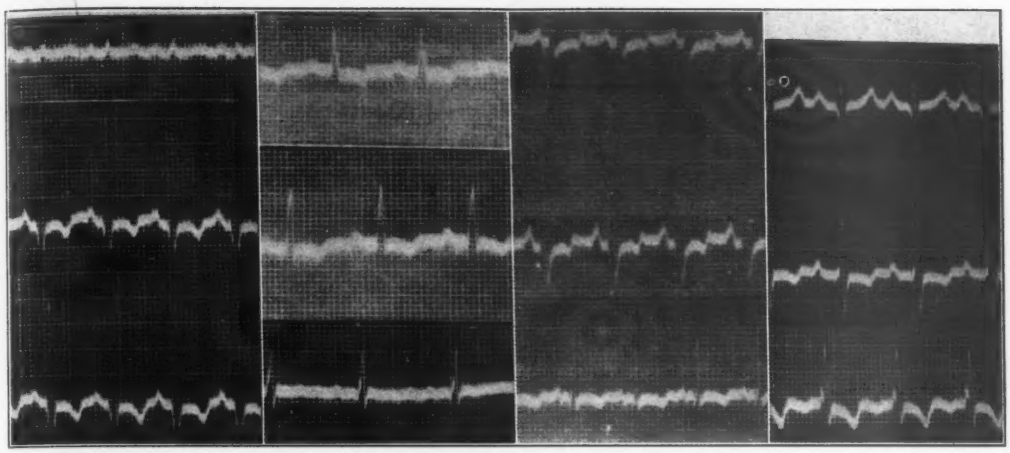

Fig. 13—Case Report 3 Fig. 14—Case Report 4 Fig. 15—Case Report 5 Fig. 16—Case Report 6

berger [6] on dogs, and Samajloff [11] on frogs. We have seen the same curves (Fig. 15) in the course of fatal purpura hemorrhagica and Cohn and Swift [12] have observed them in acute rheumatic fever.

COMMENT

Correlation of clinical electrocardiographic and autopsy studies of patients with coronary artery disease may amplify considerably the usual description of the symptomatology. In a number of instances the disease makes its first clinical appearance by sudden death. In the remainder, however, the symptomatology is extremely varied. This variability is an important diagnostic sign, and is produced by small areas of infarction due to obstruction or occlusion of smaller branches of the coronary arteries. These patients complain of attacks of dizziness after effort or sudden spells of breathlessness or palpitation of short duration often associated with substernal pressure or slight epigastric distress. Between attacks the patient may feel well, but minor symptoms may be found by careful questioning. Physical signs may be absent or, if present, may be difficult to evaluate. Sooner or later grave symptoms make their appearance. These are usually distress on effort or even severe anginal pain associated with symptoms of myocardial insufficiency. In a large number severe attacks of angina pectoris occur. In these patients the pain is often in the epigastrium and associated with fever, leukocytosis, and vomiting, and unless an apical pericardial friction rub is found, errors in diagnosis may be made. In the remainder myocardial insufficiency ensues and pain is never a prominent feature. The disease is produced essentially by slow sclerosis of the left coronary artery. When the artery is narrow in its proximal portion death from angina pectoris is the rule. When the thick-walled artery is dilated in its proximal portion multiple areas of myocardial degeneration and fibrosis occur from occlusions of small terminal arteries and left ventricular failure, often without pain, ensues.

CONCLUSIONS

1. The high degree of specificity of the coronary T wave has been confirmed by this study.
2. The presence of a coronary T wave in nine cases of syphilitic aortitis has been demonstrated.
3. Two examples of proved and two of probable embolism of the coronary artery have been recorded.

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838 Pacific Mutual Building.

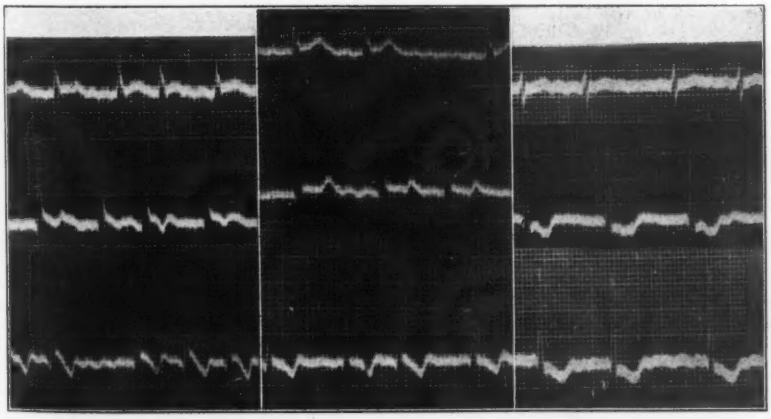

Fig. 17—Case Report 7 Fig. 18—Three days later Fig. 19—Six weeks later

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DISCUSSION

James B. Herrick, M. D. (122 South Michigan Avenue, Chicago, Illinois)—Studies of this character are desirable, as they may throw new light on the physiology and pathology of the heart. They will also aid in diagnosis.

The clinical picture of acute obstruction of larger branches of the coronary arteries is fairly definite. Electrocardiographic findings are here confirmatory rather than decisive. They may, however, be helpful in telling the location of the lesion. The electrocardiograph may be of greater help in the group of cases in which there has been a sudden obstruction of smaller branches of the coronary artery, or in the other group in which the obstruction with resulting myocardial changes has been more gradual. It is in these two groups that the startling dramatic picture of sudden obstruction is lacking, and it is here that the tracing made by the instrument of precision may make clear symptoms that would otherwise be obscure. Such studies, therefore, as those of Doctors Berman and Mason are to be encouraged.

One must recognize, however, that an abnormal graph may be produced by lesions that are not in the strict sense coronary, at least not due to defective coronary circulation. Toxic conditions as met with in infections or in the free use of digitalis may markedly alter the electrocardiogram. Presumably here the effect is due to, primarily, alteration of the myocardium.

Perhaps the doctors' paper will convey the impression that it is by the changes in the T wave alone, or, chiefly, that coronary disease may be recognized, though I am sure they do not intend to convey such an impression. As their own figures show, other features also may point to disorder in the myocardium and the conducting system, *e. g.*, changes in the Q. R. S. portion of the graph.

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William J. Kerr, M. D. (University of California Hospital, San Francisco)—There is no doubt that the electrocardiogram may give us valuable additional information in regard to the condition of the myocardium. With such observations as we have made over many years, we feel that we can get a pretty good idea of what is going on in the heart muscle by electrographic study. The general picture of coronary occlusion with its persistent mediastinal pain, the appearance of vasomotor collapse, the slight fever, leukocytosis, and low blood pressure, is now becoming pretty well recognized by clinicians. This condition, I believe, should be sharply differentiated from the symptoms of angina pectoris with its transient attacks ushered in by effort and excitement and relieved by nitrites or rest. We have come to place a great deal of reliance on the general clinical picture plus the examination of the heart itself. On this examination of the heart we usually find a diminished first sound, which is often slurred or blurred at the apex, and a second sound which is greater than the first sound. Sometimes we find a pericardial rub in the acute cases. The x-ray film sometimes will show a bulging of the apex of the heart suggesting the possibility of an aneurism of the heart wall. This is more often seen in the old cases where there have been recurrent attacks of occlusion. The more one correlates the clinical findings with the electrographic findings the more one can predict what the electrocardiogram will show. The changes which we get in persons with a marked left preponderance, which is usually associated with hypertension, is of course well known to everyone. There is then a transitional stage which one can note bridging over to a rather typical bundle-branch block.

The usual criteria for an interpretation of a bundle-branch block should of course be present before we make such an interpretation, but we feel that we can anticipate the finding of a bundle-branch block. There are cases where defects in the conduction system produce bizarre electrical reactions. The higher we go in the Purkinje system the more sharply the lesions in the main branches of the bundle are differentiated, the more sharply the electrocardiogram will apparently demonstrate this. One, however, must be careful in his interpretation of the electrocardiogram, particularly in the direction and shape of the T waves in Lead 3. Sometimes also in Lead 1 the T wave may be inverted without other evidence of defect excepting for the presence of a left preponderance. Digitalis will of course at times confuse the picture, but in my experience with this drug, which agrees with the reports of others, inversion of the T waves in Lead 3 exceeds that of Lead 2 or Lead 1.

In referring to the electrocardiograms presented by the authors, I would place different and more complete interpretations on a great many of those shown. In Fig. 1, for example, there is no definite inversion of the T wave in any of the leads, although the T waves tend to be diphasic in Lead 1. There is definite slurring of the S wave which is also noted slightly in Leads 2 and 3. In this instance I would place the damage rather low in the heart and not involving one of the main branches. One certainly could not say here there was a typical T wave of coronary occlusion. In Fig. 2 there is a very marked left ventricular preponderance which is probably due to right bundle-branch block, showing all the necessary criteria for this interpretation. In such instances the T wave is opposite in direction to the main deflection. In this case there is also difficulty to make out the auricular waves and there probably is evidence of further damage in the auriculo-ventricular conduction system. In Fig. 3 the T waves are inverted in Leads 1 and 2 with the convexity upward, but the thing of great interest here is the small amplitude of the initial phase of the ventricular complex which, in our experience, indicates a grave myocardial damage. In Fig. 4 there is a definite tachycardia with a rate of about 150 with evidence of blocking in the right branch of the conduction system. This resembles very much some of the curves we have of ventricular tachycardia, although it may be due to a nodal rhythm. In these four examples, Figs. 1 to 4 inclusive, we have four entirely different types of electrocardiographic evidence of myocardial damage, and I do not believe that one could pick out any particular feature, such as the T wave, and say that that is the chief evidence of a certain kind of damage. In all instances there is evidence of grave myocardial damage, and in many of the examples shown, one might expect to find a patient with serious disease of the heart.

One might also take up some of the other figures shown, for example, Fig. 5, which shows a very marked left preponderance with what, I believe, is on the borderline between the ordinary left ventricular preponderance which we see and a right bundle-

branch block. There is also evidence of a delayed conduction time from auricle to ventricle in this case. Fig. 6 is one of the most interesting ones shown, and it seems to me there are so many variations in the complexes of the ventricle that we can believe that this indicates very grave myocardial damage. There are apparently extra systoles shown at "X" in the three leads with a very remarkable curve in Lead 1, suggesting ventricular tachycardia. There is probably a defect in the right bundle. No auricular waves are clearly shown suggesting that the patient has auricular fibrillation as well. I do not believe that the direction of the T waves in this case alone would give us any real clue of the cause of the trouble.

In Fig. 7 we have very marked inversion of the T waves in Lead 3 and less so in Lead 2. These we have seen in patients whom we have thought presented clinical evidence of a coronary occlusion, and I have not seen such marked inversion of the T wave in patients on digitalis therapy. In Fig. 8 we have another instance similar to Fig. 5 which is borderline between a left preponderance associated with hypertension or a high pulse pressure and that associated with a bundle-branch block. The T waves here are as characteristic as any shown by the authors for coronary occlusion. Figs. 9, 10, 11, and 12, show very much the same picture as Fig. 8. In Fig. 10, I believe, we can definitely say that there is a right bundle-branch block with one ventricular extra systole shown in Lead 2.

In Fig. 13 we see inverted T waves in Leads 2 and 3 suggestive of digitalis action. The rate, however, is more rapid than that usually observed when toxic digitalis effects have been produced. The same might be said for Fig. 16, which resembles Fig. 13 very closely. In Figs. 14 and 15 the T waves in Lead 1 are inverted and diphasic. In Figs. 17, 18, and 19, there is, of course, inversion of the T waves in Lead 3 and in Figs. 17 and 19 also of Lead 2. This could be due to digitalis therapy. In all instances the auricles apparently are fibrillating. I should not attach too much importance to the T waves in these cases in Leads 2 and 3 if they were not also inverted in Lead 1.

The authors' observations are very interesting, but I would call attention to the great variation shown in the electrocardiograms in these cases and wish to state that in my experience coronary occlusion may give a great number of manifestations all the way from slight evidence of myocardial damage to the more extensive type with complete heart block, or complete bundle-branch block, or ventricular tachycardia—even ventricular fibrillation. They might all occur one after the other in the same individual in different stages of the disease. The finding, however, of some of the bizarre forms which have been described, should help us to improve our knowledge of the underlying processes which produce the clinical picture in these cases. In many instances, I believe the evidence of grave myocardial damage can be found on the careful physical examination of the heart.

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Doctor Mason (closing)—We shall not attempt to discuss all the points brought up by Doctor Kerr in his comments. A few, however, need some clarification. None of the patients had received digitalis, so that factor may be dismissed. We were not interested primarily in "aborization" blocks, bundle-branch blocks, abnormal rhythms or evidences of myocardial damage in general, for such electrocardiographic alterations were to be expected and were found with great frequency in patients with coronary artery disease with or without angina pectoris. Nor were we interested primarily in inversion of the T wave. A study of the tracings published by Rothberger and Winterberger, Smith and Pardee, and of the tracings of proved myocardial infarctions in this paper, will show the changes in the S-T interval which are characteristic although possibly not pathognomonic of large areas of degeneration, from any cause, in the muscle irrigated by the left coronary artery. The S-T interval in such instances begins anywhere along the S wave, ending in a very acute T wave. This T wave is usually inverted in Lead 1, and high and upright in Lead 3. We feel sure that a study of these details will show the "family resemblance" of these curves. Doubtless many patients with myocardial claudication will not show such characteristic electrocardiographic curves, but that does not lessen the value of such tracings when present.

HALLUX VALGUS*

REPORT OF CASES

By Merrill C. Mensor, M. D.
San Francisco

Discussion *by Leonard W. Ely, M. D., San Francisco; Edward C. Bull, M. D., San Francisco; Maynard C. Harding, M. D., San Diego; John C. Wilson, M. D., Los Angeles.*

AT the suggestion of Dr. L. W. Ely, who has for many years been interested in the possible congenital etiology of hallux valgus, I have attempted to collect and correlate some fifty-odd cases treated in the orthopedic clinic of Stanford University during the past three years.

The question of the cause of this deformity is still an open one and upon reviewing the literature we find that nearly every article presents a different theory. Perhaps this is one reason our treatment of this condition is not all that we desire.

REVIEW OF LITERATURE

In the early part of the twentieth century Dwight, and subsequently Young, of Philadelphia spoke of the congenital etiology of this deformity calling attention to the varus position of the first metatarsal and attributing it to an anatomical anomaly caused by an accessory bone between the first and second metatarsal which they designated as the "intermetatarseum." This bone mechanically forced the first metatarsal into varus, weakening the ligaments and causing the deformity. Subsequent workers have failed to identify this anomaly, and I have reviewed our x-rays very carefully as well as a series of some one hundred "normal" feet without finding this condition.

In 1912 Ewald called attention to the congenital etiology of this condition reporting a large series of cases. The facts which he brought out at that time are essentially as follows: there is present a definite varus of the first metatarsal with changes at either the metatarso-cuneiform joint or a twist in the shaft of the first metatarsal at its base which causes a varus deformity of this bone, with a secondary abduction of the phalanges. This picture reminds one of the structure of the foot in the ape and is probably evidence of an atavistic tendency. Over 50 per cent of these cases had a positive family history. Ewald very sagely questions that if this condition is due to ill-fitted shoes as advocated by a great number of physicians, why is it not more prevalent among the upper class of women who are constantly confining their feet in tight, narrow shoes? His conclusion tallies with my experience, that this deformity is far

* From the Department of Orthopedic Surgery, Stanford University Medical School.

* Read before the San Francisco County Medical Society, August 17, 1926.

TABLE 1—*Résumé of Cases Treated for Hallux Valgus*

Case No.	Sex	Age	Duration of Symptoms	Duration of Deformity	Arthritis	Family History	Short Heel Cords	Foci of Infection	Treatment
141623	F	21	8 years	7 years	O	....	X	.....	Shoes
145568	M	68	10 years	30 years	X	....	O	Amebiasis	Emetin
89470	M	44	10 years	.....	X	....	O	.....	.....
139109	F	40	8 years	30 years	X	....	O	Amebiasis	Operation
140703	M	41	12 years	20 years	X	X	X	Teeth	Operation
144312	F	51	20 years	20 years	X	....	O	Teeth	Operation
31834	F	2	Metatarsus	Varus	O	X	X	.....	.....
31835	F	24	None	Childhood	O	X	X	.....	.....
107970	M	66	6 years	35 years	X	....	....	.....	Operation
127528	F	35	2 years	.....	X	....	X	.....	Operation
145344	F	45	5 years	Childhood	X	....	X	.....	.....
96422	M	48	10 years	.....	X	....	X	.....	Arches
99660	M	39	3 months	.....	X	....	X	Tonsils	Operation
71803	F	59	3 years	9 years	X	....	X	Teeth	.....
132639	F	43	3 years	4 years	O	....	X	.....	.....
140556	M	16	3 years	.....	O	....	X	.....	.....
118220	F	22	1 year	4 years	X	....	....	Teeth	.....
11849	F	45	15 years	15 years	O	X	X	.....	Operation
109174	M	58	2 years	2 years	O	....	....	.....	.....
104814	M	42	5 years	.....	O	....	X	.....	Operation
124246	F	50	1 year	1 year	X	X	....	Teeth	Arches
84950	F	53	4 years	.....	X	X	....	Teeth	.....
52610	M	53	15 years	.....	X	....	....	Teeth	.....
135931	M	46	1 month	1 year	O	X	....	.....	Operation
129003	F	40	10 years	6 years	X	....	....	.....	Operation
64510	F	55	10 years	Childhood	X	....	....	Pelvic	.....
.....	F	63	.....	.....	....	....	....	Amebiasis	Emetin
146984	M	38	6 months	3 years	....	X	X	.....	Operation
120555	M	59	1 month	.....	X	....	....	Teeth	Operation
120404	F	52	3 years	20 years	X	X	X	Amebiasis	Emetin
147973	F	63	None	Childhood	O	X	X	.....	Non-painful
H. C.	F	59	2 years	36 years	X	....	....	Amebiasis	Emetin
146653	M	42	8 years	.....	X	X	....	G. U.	Emetin
D. C.	F	54	.....	Childhood	X	X	....	.....	.....
150802	M	12	None	Varus	O	X	....	.....	.....
146486	F	54	6 years	Childhood	X	....	X	None	Emetin, oper'n
E. H.	F	23	None	Childhood	O	X	....	.....	Operation
152685	F	47	Many years	.....	X	X	....	Teeth	.....
152168	F	61	6 months	Many years	O	....	....	.....	.....
33947	F	65	2 years	6 years	O	O	....	.....	Operation
139474	F	63	2 years	6 years	X	O	....	.....	Operation
112206	M	9	Metatarsus	Varus	O	X	X	.....	.....

more common among the laboring classes who would not tolerate tight, ill-fitting shoes.

In medical literature ideas frequently are presented, forgotten and presented again. Within the past year a prominent orthopedic surgeon called attention to the varus deformity of the first metatarsal and suggested an operation similar to that advocated thirteen years previously by Ewald, that is, an osteotomy at the metatarso-cuneiform joint correcting the varus deformity at its base rather than by means of the usual operation.

SYMPTOMS

The two main symptoms of so-called "bunions" for which a patient consults a doctor are deformity and pain. It is interesting to note that the majority of patients came because of pain in the great toe joint rather than because of the deformity *per se*. The predominant age was between the fourth and sixth decades, the time when chronic arthrites are most prevalent. Of those patients with painful joints I found in forty-eight percentage definite x-ray evidence of arthritic change. This was later checked in the laboratory in cases operated on. The pathological picture was similar to that seen in the chronic arthritic joint and disclosed areas of aseptic necrosis in the head of the first metatarsal with increased fibrous proliferation. Some patients showed large areas where the articular cartilage had been denuded with irregularities of such a nature that it was easy to see why joint motion was painful. The proximal phalanges were strangely free from any macroscopic involvement.

Ewald's statement regarding the obliquity of the cuneiform metatarsal joint with an apparent change in the shape of the cuneiform was noted

Fig. 1—Case 3184a. Mother with marked hallux valgus deformity

Fig. 2—Case 3184. Daughter (age 2 years) of patient cited in Fig. 1. Note metatarsus varus of both feet with epiphyseal changes

Fig. 3—Case 147973. Female, aged 63 years. Note extreme deformity which has never been painful

roentgenologically. A common finding was that the deformity had been present for a number of years without causing symptoms, but in the past few months it had become unbearable because of pain. May not pain be the sign of arthritic changes? With this in mind I have given five patients emetin with noticeable improvement. In nearly every patient with definite evidence of arthritis I likewise found some possible focus of infection, either bad tonsils, diseased teeth or amebiasis.

I am convinced of a familial proclivity toward this condition. It was only in the last twenty-five patients that a careful family history revealed such tendency in over ninety per cent, extending back in one patient over three generations. Two patients (Figs. 1 and 2) are exceptionally interesting: the first a mother with a definite hallux valgus and her daughter, aged two years, with a well-marked metatarsal varus; the second patient was a mother who complained of bunions. Her history disclosed that her mother and grandmother both had the same deformity, and the x-ray of the feet of her two small children showed definite metatarsus varus. It will be interesting to see if these children will develop a hallux valgus deformity.

Three patients with a marked deformity (Fig 3) came to me with other complaints and this condition was only discovered in the course of the routine examination, the patient being quite unaware of any discomfort other than the difficulty of obtaining large enough shoes. X-rays showed a marked deformity but no evidences of arthritic changes.

A predominant physical finding in these patients is a short heel cord; this is apparently a factor in the condition, but to what extent I will not discuss at this time.

TREATMENT

Regarding treatment there has been a variety of technique followed and consequently I am not in a position to quote the results of any one of them. There have been resections of the head of the metatarsal bone, oblique osteotomy and linear osteotomy, some of which were successful while often other patients still complained of pain after the deformity had been corrected.

In these patients it is possible to do considerable damage by opening an arthritic joint, so allowing the inflammatory process within the bone marrow to be disseminated. I am planning in the future, therefore, to follow Ewald's technique and keep entirely away from the diseased joint. If the patient has an arthritis, a search for and removal of the possible foci of infection, followed by proper antiarthritic treatment should precede any operation. If there is simply a slight exostosis with a mild degree of metatarsus varus, a linear resection of the exostosis, leaving the joint surfaces intact is usually sufficient. If there is a marked varus deformity the Ewald operation is then the procedure of choice, provided the valgus deformity is not too extreme or of too long duration. With the Ewald procedure I have noted, that due to the contracture of the joint capsule on the lateral aspect, it is difficult to maintain the

Fig. 4—Boy, aged 12, showing definite metatarsus varus. Note also irregularities of epiphyses.

Fig. 5—Brother (aged 3 years) of patient cited in Fig. 4 showing similar deformity.

Fig. 6—Mother of patients cited in Figs. 4 and 5. Note definite hallux valgus deformity.

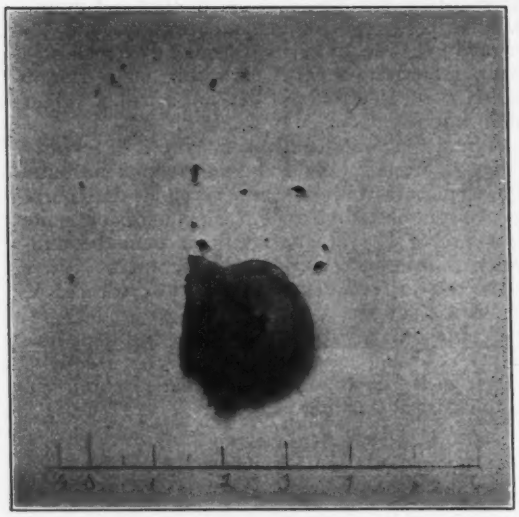

Fig. 7—Photograph of resected head of first metatarsal bone showing typical erosion of cartilage with cavitation and irregularities

phalanx in the corrected position in spite of incision and freeing of the joint capsule.

CONCLUSIONS

1. Hallux valgus is a congenital condition caused by a varus deformity of the first metatarsal; the abduction of the great toe being secondary, and due to the pressure of shoes.

2. The deformity itself is not painful; pain is due to arthritic changes in the great toe joint.

3. There is definite familial tendency among these patients.

4. Short heel cords are a frequent part of the deformity complex.

5. The procedure of choice is operation after the arthritis has become quiescent, the most logical point of attack in selected cases being in the metatarso-cuneiform joint.

490 Post Street.

DISCUSSION

LEONARD W. ELY, M. D. (Stanford University Medical School, San Francisco)—Doctor Mensor's paper brings up again a state of affairs in medical teaching that has always interested me, namely, the acceptance of the obvious as true. Time and again I have taken the trouble to investigate some "well-established fact," and have found that it is based on nothing more substantial than the unsupported opinion of its originator. *Post hoc ergo propter hoc.* No case of hallux valgus in a person who did not wear shoes has ever been reported. Therefore shoes are the cause of hallux valgus. What could be simpler? We all wear shoes, therefore we all have hallux valgus, and those who wear the worst shoes have the worst deformity. This might do for an unintelligent laity, but it explodes when we investigate it. However, it is standard teaching in practically all medical books, and little attention is paid to Young and Ewald when they call attention to its absurdity. Doctor Mensor has done a good piece of work, and has accumulated strong evidence to back up his conclusions, but I fear he will be disappointed by their reception. An "established fact" is not easily overturned. It is easier to accept an obvious explanation than it is to weigh evidence. The latter requires thought.

A patient with hallux valgus consults us for one of two causes, *i. e.,* pain or deformity. If for the latter, then almost any type of operation will be successful; if for the former, not necessarily so. The operations for hallux valgus are legion, and the discussion on the operative treatment in an orthopedic meeting is always interesting, and sometimes acrimonious. Positive statements are wont to be plentiful, and facts few. It appears that for a great many patients any operation is successful, but that in some cases pain and stiffness follow any operation on the metatarsal joint. These symptoms cause the operator to change his method of operating thereafter, and to repeat his experience. The reason for this, I think, has been pointed out by Mensor. The operation has been done on diseased tissues in the unsuccessful cases. In all the discussions on hallux valgus there is one aspect of the subject conspicuous by its absence—the pathology. You cannot solve these problems by abstract reasoning. The diseases of the joints are no exception to the general rule. If you wish to understand them, and devise a rational method of treating them, you must study their pathology. This is one thing in which most men have no interest. Their minds are on higher things.

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EDWARD C. BULL, M. D. (Shriners' Hospital for Crippled Children, San Francisco)—Doctor Mensor's paper places emphasis where it is needed.

Metatarsus varus as the fundamental cause of many cases of hallux valgus has frequently escaped recognition, with the result that fundamentally incorrect treatment has been applied.

Conservation in the surgical treatment of hallux valgus is, I believe, of prime importance, especially in the presence of age or arthritis.

The correction of a causative metatarsus varus is a logical and fundamentally conservative procedure in the treatment of properly selected cases of hallux valgus.

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MAYNARD C. HARDING, M. D. (425 Electric Building, San Diego)—Doctor Mensor has presented with convincing clearness a view which I feel will secure a wider acceptance than Doctor Ely predicts.

Orthopedists, at least, quite generally agree that metatarsus varus is often hereditary. I have obtained a clear family history in a great many cases, and have seen a number of small children with this deformity well marked.

As Doctor Ely so well says, we must study the pathology before advising treatment. We should cease classifying all kinds of bunions under one head. There are at least four types to be differentiated, each with distinct indications for treatment.

The first type is a true hallux valgus. It is characterized by normal position of the metatarsal bones, an exostosis on the mesial side of the first metatarsal, overlaid by a bursa and a corn. The great toe rarely has more than forty-five degrees deflection, and is but little rotated.

The second type is metatarsus varus, with a divergence of the first metatarsal, a great deflection of the toe, and the usual exostosis and corn. The sesamoids are displaced outward, and after inflammation one or both adhere to the metatarsal head. This in turn causes the rotation of the toe so common in advanced cases. Any treatment that does not take this pathology into account will fail to give relief in many cases.

The third type is hallux valgus with osteomyelitis. Doctor Mensor is surely right in his conclusions regarding it. Such feet are not to be operated on until the arthritis has at least become quiescent.

The fourth type is hallux rigidus. It may be associated with the last type and requires special operative consideration.

With this minimum of pathologic classification in

mind we will not be led into a routine treatment of all cases.

JOHN C. WILSON, M. D. (1136 West Sixth Street, Los Angeles)—Doctor Mensor has presented some very convincing arguments to prove that metatarsus varus is an important etiologic factor in the development of hallux valgus deformity. The majority of us are inclined to drop into the pitfall pointed out by Doctor Ely, that shoes must be the important causative factor. It is undoubtedly true that metatarsus varus is a predisposing factor in the development of hallux valgus, but there is some doubt about it being the sole explanation.

Very few cases of hallux valgus in men come under our observation; on the other hand the condition is extremely common in women. We are all aware that shoes for men as they are constructed today follow anatomical lines rather closely, while shoes for women are constructed according to the ideal of Confucius. Whether or not women would develop hallux valgus deformity if they wore shoes resembling those worn by men cannot be stated, but the fact remains that the style of women's shoes will probably not be changed, so therefore it must be considered in both cause and effect.

Too much emphasis cannot be placed upon the inadvisability of operating upon arthritic joints. Infection is disseminated throughout the capsule and soft tissues, resulting in prolonged disability, pain, and swelling. The operative technique in itself is probably not the most important phase in the treatment of hallux valgus. While the Keller operation is preferred, it is safe to say that any operation in vogue will be satisfactory in properly selected cases if the after-treatment is carefully carried out. Restoration of balance between the flexor and extensor muscles of the great toe, and a free range of motion in the great toe joint are essential to the normal gait.

Doctor Mensor deserves great credit for the conciseness and clearness with which this subject has been presented.

BLADDER TUMORS*

By J. C. NEGLEY, M. D.
Los Angeles

DISCUSSION *by Robert V. Day, M. D., Los Angeles; Charles P. Mathé, M. D., San Francisco; William E. Stevens, M. D., San Francisco.*

FOR the unknown factor of etiology many reasons have been presented at various clinics and by research groups throughout the world, but none have been proven, hence a discussion of the etiology of bladder tumors is unnecessary.

PATHOLOGY

Over 90 per cent of bladder tumors are epithelial in origin. The many and varied classifications of these tumors are of academic rather than of practical interest. The urologist must make his prognosis and outline his treatment after a cystoscopic examination. Through this means, the classification of Young of Johns Hopkins may be adopted:

1. Papillomas, single or multiple.

Papillomas have distinct pedicles, many and varied forms and shapes of papillae. Single tumors may be benign or malignant, but multiple ones are almost always malignant.

2. Papillary, non-infiltrating tumors with a tendency to spread laterally.

Lateral spread tumors spring from central papillomas and have a sloping rather than an overhanging edge, ulceration is uncommon and infiltration late.

3. Tumors consisting of intravesical mass with bladder-wall infiltration and ulceration.

Intravesical mass tumors begin as papillomas, but later roll up into mushroom mass with a gray necrotic base which may contain calcareous deposits. Most all these tumors have infiltrated the bladder wall and are generally found on the base of bladder.

4. Entirely infiltrating tumors with little intravesical portion.

Entirely infiltrating or bladder-wall type are uncommon, but extensive with widespread ulceration and contracted bladder.

5. Pedunculated tumors, not infiltrating, not papillary.

Pedunculated tumors not infiltrating, not papillary, are very rare, mostly connective tissue tumors as fibroma, myxoma, sarcoma.

DIAGNOSIS

Generally made with the cystoscope, but in cases where this instrument cannot be used we depend on history, symptoms, small pieces of tumor passed in urine, cystograms and, at times, through cystotomy for other causes. Rectal or vaginal palpation is at times of value.

SYMPTOMS

Unfortunately the same line of symptoms is present in many other conditions and none is pathognomonic. The common ones of aid are hematuria, frequency, pain, burning and difficulty of urination. The hematuria is generally the first to appear, intermittent in type, is given little attention by the patient, and, sad to relate, often as little by the physician. The amount of blood varies from a few drops to enough to exsanguinate the patient or fill his bladder with clots necessitating a cystotomy.

Pain, independent of urination, is a rather late symptom and is due to nerve pressure through infiltration of the bladder wall. Frequency may be present early or late, due to cystitis, irritation of infiltrating growth on nerve ends and lessened capacity. The constitutional symptoms as cachexia, anemia, loss of weight, are not so evident here as in malignancy elsewhere in the body.

METASTASIS

Generally speaking, bladder tumors are slow to metastasize, but with our improved methods of diagnosis and a more careful check of our records this opinion may have to be revised. Judd reports metastases in 21 of 166 deaths that came to autopsy, of which six were in abdominal viscera, four in pelvic bones, two in lungs and two in the groin. These were single instances of patients with metastasis in the abdominal wall, rectum, humerus, regional lymph nodes, lumbar spine, uterus, and retroaortic lymph nodes.

TREATMENT

Many and varied are the methods: some one or other a hobby of one surgeon, while his colleague may use them all in the course of a year or perhaps run the entire gamut on an individual case. Perhaps we owe a great debt to the enthusiast in any one line of treatment, for on him falls the burden and opprobrium if he fails and little

* Read before the Urology Section, California Medical Association, at its Fifty-Sixth Annual Session, April 25-28, 1927.

TABLE 1—*Symptoms and Their Duration*

	Number of Cases	3 Weeks	6 Weeks	2 Months	3 Months	4 Months	5 Months	6 Months	8 Months	9 Months	1 Year	2 Years	3 Years	4 Years	5 Years	Life		
Hematuria	21	1	2	1				5		2	3	2	2		1			
Hematuria, Dysuria and Frequency	36				5	6	5	5	4		6	1	1	1	1	1		
Dysuria and Frequency	25		2	3	4	3		3	2	2	4		1	1				
Pain	8					3				2	3							
No Symptoms	15																	

praise when the mortality rate is lowered and results improved. The most used methods of today are surgical diathermy, radical surgery, radium through open or closed bladder, fulguration through cystoscope, x-ray, the Percy cautery, electrocautery, or a combination of any number of them.

RESULTS

The literature assuring results, as published with reports, grows brighter each year and, in fact, becomes encouraging. Young and Scott report 380 cases from Brady Institute, 27 per cent cured by various methods. They consider surgery too great a risk in extensive growths. They believe 75 per cent of papillomas and 25 per cent of infiltrating carcinomas should be cured by fulguration, radium, or electrocautery. Federoff reports 165 cases. He advises two-stage cystectomy in selected cases, but cites mortality rate 50 to 68 per cent in single-stage cystectomy in 321 collected cases. Deaver and McKinney report 121 cases and believe that when partial resection cannot be done without transplantation of ureters, fulguration or cautery should be used and that ureteral transplant and resection is not justifiable. Squier believes in segmental resection, and cites twenty out of seventy-five patients alive, without recurrence eight to twelve years after operation. Kidd reviews results in 162 collected cases; says death was due to obstruction of ureters, exhaustion, pain, bleeding, and not to spread of tumor. Twenty-six of his cases had malignant papilloma; twelve resisted diathermy; twenty-eight had partial resection, with thirteen cures. Bumpus, in 527 cases from Mayo Clinic, concluded radium alone not successful, but was most beneficial after surgery or fulguration. Radium followed by operation gave poor results. Tumors

TABLE 2—*Results of Treatment*

	Cause of Death										*Alive and Well*					
Kind of Treatment	Dead	Number of Cases Living	No Record	Pneumonia	Metastases to Lung, and Spine or Long Bones	Bilateral Hydronephosis	Uremia	Pulmonary Tuberculosis	Pyelonephritis	Recurrence in the Bladder	1 to 3 Months	3 to 5 Months	5 to 9 Months	9 to 12 Months	1½ Years	2½ Years
1. No Surgery Palliative	10	0	1	2 in 3 wks. 2 in 2 mos.	2 in 3 mos.	3 in 4 mos.										
2. Cystoscopic Fulguration	0	26									11	7	6	1	1	
3. Cystotomy Surgical Diathermy	7	14		1 in 20 days 1 in 4 mos. 1 in 7 mos.			1 in 12 days	1 in 1 mo.	1 in 1 mo. 1 in 2 mos.		3	6	2	1	1	1
4. Cystotomy Percy Cautery	12	1														
5. Cystotomy Electro Cautery	3	3		1 in 1 mo. 1 in 5 mos.						1			3			
6. Cystotomy X-Ray	2	2								2			2			
7. Cystotomy Percy Cautery and X-Ray	4	0								4						
8. Cystotomy Radium and X-Ray	2	1								2		1	not	imp	roved	
9. Resection	2	0	1	Peritonit	is					1 in 2 yrs.						
10. Cystotomy alone	9	5	1	2 mos. 2	6 mos. 1	3 mos. 1	3 w. 1		wks. to 3 mos. 3		(2	2	1)-	No c	hange	
11. X-Ray alone	1									1 yr. 1						

too large for resection were best treated by cautery or surgical diathermy.

In the *Journal of Urology*, February, 1927, Young stated resection should be done where easily accessible tumors are found. In other locations, electrocautery and radium. He applies radium through cystoscope in many cases. Chute of Boston considers bladder tumor treatment results disappointing, and does not believe radium is helping the situation. Bransford Lewis states radical resection sounds well, but is more theoretical than practical when applied to most of our everyday cases. Kretschmer warns of the dangers of embolism and fistula, following diathermy and of extensive fibrosis following radium.

COMMENTS ON ONE HUNDRED AND FIVE CASES

For your consideration is appended a table of 105 cases of tumor of the bladder from the Los Angeles General Hospital.

You will bear in mind that most of our cases are terminal or far advanced, and that in this class of patient an efficient and reliable follow-up history is not easily obtainable.

Pathology—Of the series of 105 tumors ninety-two were papillary carcinoma, twelve scirrhus carcinomas and one sarcoma, twenty were single with one visible pedicle, the remainder were either multiple or had fused to form one large tumor mass. The remainder came in for relief of other urinary pathology, as prostatism, calculi, etc.; and bladder malignancy was discovered in routine examination.

Diagnosis—A diagnosis was made by cystoscope in most cases and, as a rule, a section was not taken through the cystoscope. In all cases having a cystotomy the diagnosis was confirmed by pathological section. Some cases that could not be cystoscoped were diagnosed by cystogram.

Metastases—Ten Cases

Iliac lymph nodes	4
Lumbar spine	3
Lungs	1
Long bones (ribs and femur)	1
Liver, preaortic glands, and sigmoid	1

Results

	Cases	Deaths
1. No active treatment	10	10
2. Closed fulguration	26	0
3. Surgical diathermy	20	7
4. Percy cautery	13	12
5. Electrocautery	6	3
6. X-ray	5	2
7. Percy cautery and x-ray	4	4
8. X-ray and radium	3	2
9. Resection	3	2
10. Cystotomy alone	14	9
11. X-ray alone	1	1
	105	52

Cases 3, 4, 5, 6, 7, 8, 10, also had cystotomy.

SUMMARY AND CONCLUSIONS

Age: The youngest was 20 and had a sarcoma. Bladder tumors occur most frequently between the ages of 60 and 70; next between 50 and 60; and closely following this decade, with only a difference of four, is that of 40 to 50. Sex shows a preponderance of males, probably because they come oftener to the urologist for cystoscopic examination. If women with bladder symptoms were cystoscoped more frequently perhaps more bladder tumors would be discovered. Methods of treatment in this series of cases at least seem to favor fulguration or surgical diathermy, either through a closed or open bladder. All of those having cystoscopic fulguration, to say the least, had less discomfort and loss of time than those having x-ray or treatment through the open bladder.

My observation has been that large size and apparent malignancy should not deter one from using fulguration through cystoscope, for many of those here recorded had reached generous size. Surgical diathermy through the open bladder causes the patient comparatively little discomfort and pain. There seems to be only slight tendency to fibrosis, thus making the dreaded hydronephrosis a less frequent complication. As to the other methods used in this series, the Percy cautery, electrocautery, x-ray, radium, resection, or a combination of any number of them; there is not a sufficient number to speak authoritatively. Also most of the cases treated by the latter methods were terminal ones in which no form of treatment was thought of benefit.

The Percy cautery has advantage in that there is but little postoperative suffering; the technique is not complicated and if used early enough the cures should be as many as by other methods. Disadvantages are the danger of fistula, quite marked fibrotic changes which seem to predispose to hydronephrosis and the large amount of absorption from the burned area.

X-ray seems to cause a great deal of suffering and fibrosis. Radium is awkward and inaccurate when used through the cystoscope (unless needles are implanted in the mass). These are often in the care of radium clinics, where the workers are little versed in cystoscopic pathology and technique. Vice versa, the trained cystoscopist is little versed in the knowledge and use of radium. Better cooperation between radium clinics and urologists would enhance favorable results (or more complete recoveries). Radium does cause pain, suffering, and a great deal of fibrosis. Resection with the cautery knife of that part of the bladder wall containing the tumor mass, where it is easily accessible, would seem to be an ideal method, but the operation of total cystectomy, with cold knife or cautery carries too high a mortality rate to be justifiable in more than a few selected cases, but when resection is done by any method it should be preceded by ureter transplantation. When both operations are performed at the same time the mortality rate becomes too high to make it justifiable.

219 West Seventh Street.

DISCUSSION

ROBERT V. DAY, M. D. (412 West Sixth Street, Los Angeles)—I have listened with a great deal of interest to Doctor Negley's paper on bladder tumors. His classification, diagnostic methods employed and technique of treatment are comprehensive.

This much may be stressed, viz.: that slightly over 50 per cent of all bladder tumors at the moment of

the first cystoscopic examination are benign papillomas, all potentially malignant and sure to become malignant if untreated, improperly treated or neglected, and yet susceptible in almost every instance of a cure by high frequency methods through a cystoscope. Of the remaining 45 per cent at least four-fifths could have been easily diagnosed at the start, when they could have been readily cured by high frequency methods if the clinical signs of bladder tumor had been heeded and a cystoscopic examination made. In other words over 90 per cent of bladder tumors are clinically benign papillomata when the first symptoms begin and may be cured if the practitioner will simply heed ordinary clinical warnings and have the patient cystoscoped by a reliable urologist when these first symptoms appear. In actual practice, however, dilatory methods and procrastination with simple medical treatment without proper examination are much too frequently employed; and patient is given medicine by mouth and told that his hematuria will probably cease and he needn't worry about it. Usually the hematuria does cease temporarily or for a long period under any form of treatment or without any treatment, and then both the patient and the physician develop a false sense of security. One of the most valuable lessons to be learned in the practice of medicine is that, with the single exception of a terminal hematuria from a posterior urethritis or prostatitis of a gonococcic nature, hematuria always means organic disease or organic change somewhere in the genitourinary tract. Many a case has become hopeless simply because of delayed diagnosis and, in consequence, of delayed or inadequate treatment. Obtaining specimens of the tumor through the cystoscope for microscopic section should be done when feasible and is not contraindicated. Furthermore typing the tumor according to the classification of Broders is often invaluable from a standpoint of prognosis, of future management and for statistical purposes. Unfortunately for most of us about 50 per cent of bladder tumors observed clinically are already definitely malignant and far advanced. In this class of case the outlook is discouraging and the experience of most of us including that of the very largest clinics, is that whatever we do, not more than 5 per cent are cured. The effort is not entirely lost because most of the methods of treatment (except the reckless use of x-ray and radium) are palliative. Since over 90 per cent can readily be diagnosed while still curable by the application of high frequency current through a cystoscope, often reinforced by radium application through the cystoscope, the real promise of cure is an adequate and immediate cystoscopic examination of every case of hematuria except terminal hematuria from acute gonorrhea, and also adequate and prompt urological examination of patients with dysuria and urinary infection.

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CHARLES P. MATHÉ, M. D. (844 Phelan Building, San Francisco)—Doctor Negley's timely paper on bladder tumors is a distinct contribution to the literature and adds to the statistical collection of cases presenting these lesions. It is apparent that statistics such as these collected from the various hospitals throughout the country will in the aggregate give us valuable information as to the management of vesical neoplasms. Eighty-five per cent of the cases reported showed symptoms, the most frequent of which were hematuria, dysuria and frequency of micturition. Early cystoscopic examination of patients presenting the clinical syndrome of hematuria and difficulty in urination is the only accurate way of demonstrating a bladder tumor, be it early or late. Relief of the tumor is more likely to be obtained if the diagnosis is made early. It behooves the internist and general practitioner to realize the importance of hematuria and the possibility of malignancy being the etiologic cause and to advise the patient to have an early diagnosis by cystoscopic examination.

The treatment of bladder tumors calls for intelligent use of the various present-day methods at our command. Papillomata are always potentially malignant, but when detected early they can often be entirely destroyed by the use of the high frequency electrocautery through the cystoscope. Early cases of carcinoma are often amenable to radical surgical removal of the tumor including a fairly large margin of healthy bladder wall. In advanced cases the prognosis is exceedingly poor. The occasional good result and the frequent amelioration of symptoms, however, warrants the use of radium, deep x-ray therapy, chemiotherapy, and diathermy through the open bladder. Dr. J. Walker considers all bladder papillomas as malignant, and at the recent meeting of the western branch of the American Urological Association held in Seattle, July 7, 1927, denounced the common practice of fulguration as the treatment of these tumors and in its place advises the use of diathermy through the open bladder. In rather advanced cases which are complicated by fistula formation and bilateral hydronephrosis deviation of the urinary stream is a good palliative procedure. It not only does away with continual incontinence of urine, but alleviates actual pain and relieves the back pressure into the kidneys. I have recently had two such patients in which transplantation of the ureter into the skin of the inguinal region afforded considerable comfort and amelioration of the symptoms.

The poor results tabulated in Doctor Negley's paper emphasize our inability to meet the problem of bladder cancer. The occasional good result, however, consisting of an actual cure, warrants the energetic use of the various methods of treatment at our command. I recall a patient, a man in active business in San Francisco, suffering from carcinoma solidum of the bladder who is still living five years after complete surgical excision, also a patient who was relieved of an early malignant papilloma by electrocautery. At the present time our only hope of coping with bladder tumors seems to be through early diagnosis, and it behooves the general practitioner to realize the importance of hematuria, particularly when it occurs in a person of the cancer age.

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WILLIAM E. STEVENS, M. D. (870 Market Street, San Francisco)—Doctor Negley has condensed into comparatively few words a great deal of interest and value concerning tumors of the bladder.

His classification is concise, and fully covers the types of growths that we usually encounter.

Although hematuria, often unaccompanied by pain, is the most common symptom of this condition, its significance is often overlooked. Notwithstanding the emphasis that has so frequently been placed on the necessity for complete urologic investigation in the presence of hematuria, many patients receive instead a little urotropin or other medicine; and if, as so often happens, the blood disappears temporarily from the urine, they are discharged as cured. Bleeding may not occur again until the growth is far advanced. The poor results obtained in Doctor Negley's series of cases is largely due to the advanced stage of the lesions coming under his observation.

I have found cystography a valuable method of diagnosis when satisfactory cystoscopy is impossible.

I cystoscope as many women as men and find about the same number of bladder growths in both sexes.

In my experience the best results have been obtained in the treatment of the apparently benign pedunculated papillomata by means of fulguration through the operating cystoscope. Partial resection has proven most useful in the treatment of malignant growths not involving the base of the bladder. When the latter is involved surgical diathermy has been of great value in several of my cases. I believe that this is destined to become the most popular method of treatment for malignant tumors of the bladder.

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DOCTOR NEGLEY (closing)—In closing I wish to thank my confrères for their discussion of this paper. Doctor Mathé and Doctor Stevens both stress the poor results obtained in this series of cases. For-

tunately Doctor Day has answered this criticism better than I could in the following quotation: "About 50 per cent of bladder tumors observed clinically are already definitely malignant and far advanced. In this class of cases the outlook is discouraging, and the experience of most of us, including that of the very largest clinics, is that, whatever we do, not more than 5 per cent are cured." Since this can readily be supported by a search of the literature and statistics, I still feel that the results obtained by us were not poor but compare favorably with those of other clinics, and rest assured that, although the results may seem poor, at least they represent the results as found, uncolored by bias against or enthusiasm toward any one method of treatment. Doctor Mathé quotes Doctor Walker of Seattle as substituting surgical diathermy through the open bladder for cystoscopic fulguration. I hardly believe such a formidable, time-consuming, expensive, discomfort-producing procedure is to be preferred over simple cystoscopic fulguration in those tumors that are small and of a relative low degree of malignancy. The writer and all the discussers have again emphasized the apparent apathy on the part of the profession at large regarding hematuria. Notwithstanding the stress placed upon the importance of this symptom, the urologist is still called in, time and again, to diagnose a case that has had hematuria over a long period of time only to find an inoperable malignancy which might have been cured if diagnosed in the early stages. It is possible that the medical journals by some timely editorials or other timely articles might be able to waken the profession to the necessity of a thorough examination on all cases of hematuria of unknown origin.

INTRACRANIAL HEMORRHAGE IN THE NEWBORN *

WITH REPORT OF SIX CASES

By MORRIS H. SILVERBERG, M. D.
San Francisco

DISCUSSION *by L. I. Breitstein, M. D., San Francisco; John W. Sherrick, M. D., Oakland; John C. Dement, M. D., San Diego.*

INTRACRANIAL hemorrhage in the newborn is the most frequent and fatal injury of childbirth. The incidence is high ranging from 5 to 15 per cent, with a mortality of from 40 to 50 per cent. Reports on autopsies in deaths from all causes in the newborn by Ehrenfest,[1] Holland,[2] and Saenger,[3] show gross intracranial hemorrhages in from 40 to 50 per cent, with the greatest number having occurred in prematures and breech extractions.

At Mount Zion Hospital during the year from July 1, 1925, to July 1, 1926, in 138 clinic cases delivered on the obstetrical service, we had an incidence of 4.3 per cent. This incidence is quite low, but several babies having no symptoms may have been overlooked in this series, as spinal punctures were not done. Sharpe [4] and McClaire, in a study of spinal fluids in a series of 500 cases from twelve to twenty-four hours after birth, showed an incidence of 9 per cent. M. H. Roberts [5] in his recent study of spinal fluids taken during the first twelve hours after birth, in over 400 cases showed an incidence of intracranial hemorrhage of 14.1 per cent, with only 6 per cent presenting symptoms.

CAUSES

Intracranial hemorrhage in the newborn may occur during or after normal labors, only exhibiting symptoms in the severe cases. It is frequently overlooked.

The chief cause is trauma. The main predisposing causes are:

1. Prematurity of the infant, which renders it more sensitive to trauma, so that normal labors may be sufficient to cause hemorrhage.

2. Breech extraction, in which rapid or forceful delivery of the after-coming head produces the injury.

3. Precipitate labors, where there is sudden compression of the head.

4. Very difficult or prolonged labors, where there is excessive molding of the head with injury.

5. Instrumental deliveries.

Premature infants and breech deliveries show the greatest incidence. Where sudden compression of the head or sudden release of the pressure occurs hemorrhage is frequently the result.

The most frequent site of hemorrhage is in the free margin of the tentorium (usually at the juncture with the falx cerebri) with resulting rupture of the venous sinuses. Beneke,[6] in his method of autopsy, has shown the tentorium lacerated in supra- and infratentorial hemorrhages. Hemorrhage occurs whenever meninges are torn, but it may occur in the brain substance proper, and within the ventricles. There may be no symptoms and the intracranial hemorrhage may be overlooked.

DIAGNOSIS, SYMPTOMS, AND TREATMENT

The diagnosis is readily made when the newborn shows drowsiness, stupor, cyanosis, difficult breathing, focal signs as twitchings, poor tissue turgor, refusal to nurse, and the general symptoms of increased intracranial pressure, as separation and bulging of the cranial sutures and the fontanelles and tonic or clonic convulsions. Early lumbar puncture is an accurate means of diagnosis. The coagulation time and bleeding time should be done immediately after delivery in all cases of difficult labors or suspected hemorrhage. The coagulation time in normal newborn babies is from five to nine minutes with an average of seven minutes. The bleeding time is from two to five minutes with an average of three and one-half minutes. Increased coagulation time or hemorrhagic disease of the newborn is one of the chief contributory factors in serious intracranial hemorrhages.

The treatment is essentially one of prevention. Special precautions in breech extraction, gently hastening difficult or prolonged labors, and careful, slow instrumental deliveries will help in decreasing the incidence. Rotating prolonged occiput posterior positions manually or with the Kjelland forceps if possible and doing episiotomies are prophylactic measures. Cesarean sections should be done in those cases in which the head will not

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* From the Obstetrical Service of Mount Zion Hospital.

* Read before the San Francisco County Medical Society, September 21, 1926.

engage after the test of labor or where the pelvic measurements are too small.

As soon as there is even the slightest suspicion of intracranial hemorrhage, one should administer 20 to 30 cc. whole blood intramuscularly. This may be repeated every eight hours if necessary. (Large amounts of whole blood intramuscularly give the best results.) Horse serum and thromboplastin have been used, but whole blood gives the quickest and best results. Where the intracranial pressure is pronounced and the symptoms fail to subside, spinal punctures should be performed to relieve the pressure.

CASE REPORTS

The following six case reports on our service show a mortality of 50 per cent. Autopsies were done on two of the babies that died.

CASE 1. *Precipitate Labor*—The mother, a primipara, age 19, with normal pelvic measurements had a precipitate labor and delivered spontaneously in one hour and twenty minutes. The child gave a husky cry at birth, and was apparently a perfectly healthy normal baby. About eight hours later the child became cyanotic and began to breathe irregularly. With the usual measures for resuscitation the child was revived, but there was a tendency to collapse. Physical examination showed no bulging of the fontanelle. The heart action was very good. The lungs showed coarse bubbling râles. The child was given 1/600 grain atropin. It was then given 20 cc. of the mother's blood, intramuscularly; the child rallied for several hours, but the cyanosis and irregular respirations returned. The coagulation time was eight minutes; the bleeding time three minutes. The measures for resuscitation were again used, but were of no avail. About eighteen hours after delivery the infant died.

Autopsy—Examination revealed several large clots of blood in the subdural space, in the parietal and occipital regions, and a large amount of unclotted blood at the base of the cranial cavity. The left lung showed complete atelectasis.

CASE 2. *Precipitate Labor, with Occiput Posterior*—Mother was a multipara, in labor four hours. Male infant was delivered spontaneously, in occiput posterior position. The infant was developed normally, but was flaccid, had a marked pallor, and did not breathe spontaneously. Artificial respiration produced irregular breathing. The heart rate varied around 100 per minute. Artificial respiration, external stimulation and oxygen were employed. While preparing to give the infant whole blood the heart suddenly stopped and the respirations ceased. One cc. adrenalin was injected intracardially and a minute later a quiver could be felt in the cardiac area, and in two or three minutes an occasional heart beat was palpated. The heart rate gradually increased up to 70 to 80 per minute. During this time the infant gasped occasionally, and the above named measures of resuscitation were continued. In about thirty minutes 20 cc. of whole blood was taken from the mother and injected into the buttocks of the infant. Shortly after this injection the respirations began to occur spontaneously and the child rallied. Seven hours later the child suddenly died. A second injection of adrenalin intracardially was of no avail. We were unable to obtain an autopsy.

CASE 3. *Premature Baby with Breech Delivery*—Mother, age 36, with history of thirteen full-term pregnancies. No miscarriages. Present pregnancy was uneventful until the seventh month, at which time patient accidentally fell. About twenty-four hours after the fall the membranes ruptured and labor set in. Patient was delivered spontaneously of a male infant in frank breech position. At birth the child cried spontaneously, but the cry was feeble. There was slight pallor with no cyanosis; tissue turgor was poor. Respirations were shallow and irregular. Baby was wrapped in cotton and kept at a uniform temperature, and put on two-hour feedings. Twenty-four hours after birth the infant vomited for the first time. A little later had a generalized convulsion accompanied by horizontal nystagmus. The coagulation time was five minutes; the bleeding time one minute forty-five seconds. About two and one-half hours after the first convulsion 20 cc. of whole blood was taken from the mother and injected intramuscularly. That evening the baby had another convulsion. The only evidence of intracranial hemorrhage, in addition to the convulsions, was increased tension in the fontanelles. Forty-four hours after birth the infant suddenly expired.

Autopsy—All the positive findings were in the cranium. The sutures were widely separated, there was no bulging and no caput. On opening the cranium clear cerebral spinal fluid escaped. The meninges over the convex surface of the cerebrum were normal. On lifting the cerebral hemispheres the left side was negative, but the right posterior cerebral fossa contained about 30 cc. dark unclotted blood and the meninges of the right parietal and occipital areas were bloodstained. All the blood was subdural and was unclotted. Postmortem diagnosis: Supratentorial hemorrhage on right side, limited to the parietal and occipital regions.

CASE 4. *Prolonged Labor with Excessive Moulding of Head—Low Forceps Application*—Multipara 2. In labor twenty-nine hours. (Gwathmey anesthesia used.) Low forceps were applied as a prophylactic measure and female child was delivered. The child was cyanotic, had a weak cry, and the tissue turgor was poor. Oxygen was given. The coagulation time was four minutes; bleeding time, five minutes. Fifteen cc. of mother's whole blood was given intramuscularly and the infant responded by marked improvement in color and respiration. The following day, 20 cc. whole blood was again given intramuscularly and the baby continued to improve. Occasional twitchings were noticed for two days. The baby continued to improve in appearance and twitchings disappeared. It was given artificial feeding, as the mother did not have sufficient milk; and on discharge was apparently normal and increasing in weight. It was seen several times later and was doing nicely, gaining in weight and seemingly a normal baby.

CASE 5. *Occiput Posterior Position with Application of Low Forceps*—Mother, age 20, primipara, very anemic, hemoglobin 48 per cent. Past history revealed the fact that she had always been delicate and weak. Pregnancy was uneventful. Was in labor twenty-one hours, but the head failed to rotate anteriorly after it reached the pelvic floor. Labor was terminated by the application of low forceps. Patient had been given Gwathmey anesthesia during labor, and during delivery was given gas and oxygen and ether to the surgical degree. Pituitrin, minims iii, was given before the low forceps were applied.

The infant was delivered in an asphyxiated condition, with complete flaccidity of all muscles and a marked pallor of the entire body. About fifteen minutes elapsed before the baby was resuscitated sufficiently so that it could breathe and cry with fair regularity. Physical examination revealed very poor tissue turgor, the cranial sutures overlapped considerably, and there was a moderate caput succedaneum. The baby spent a rather restless night, did not cry lustily, and the breathing was somewhat irregular. The coagulation time was seven minutes; the bleeding time was five minutes. Fourteen hours after birth the infant was given 15 cc. of the mother's blood intramuscularly. There was no untoward reaction from the injection. Another injection of 20 cc. mother's blood was given the next day, but very little improvement was noted. On the seventh day after birth the child developed a temperature of 40 degrees C. and began to vomit all feedings. Two bowel movements during the day contained blood. Its general condition became worse. The vomiting and high temperature persisted on the eighth day, when 20 cc. whole blood was taken

from the father and injected intramuscularly. Within three hours after administration of this blood, improvement could be noted. The baby did not vomit again and the fever subsided gradually. There were no more bloody stools. The baby continued to improve and was discharged from the hospital when 24 days old in apparently perfect condition. It was last seen when about 6 months old and had developed normally, with nothing to indicate the difficulties it had experienced during its first three weeks of life.

In this patient the quality of the blood administered obviously played an important part. There was very little improvement after administration of blood from the anemic mother. There was definite immediate permanent improvement after administration of blood from the father, whose hemoglobin was 95 per cent and who was a robust individual.

CASE 6. *Normal Labor with Precipitate Delivery*—Mother, multipara, age 35. Previous pregnancies and labors normal; pelvic measurements normal. First stage of labor lasted three hours and twenty minutes. Second stage was precipitate, and baby was shoved through birth canal and delivered spontaneously with two or three strong contractions. The baby was markedly cyanotic at birth and breathing was shallow. The heart and lungs were negative, the head was normal in contour, fontanelles were open, no bulging and no caput. Oxygen was administered with some relief. The coagulation time was three minutes, the bleeding time was six minutes. Four hours after birth 10 cc. of mother's blood was given intramuscularly. This seemed to have a very marked effect, for the cyanosis decreased and the breathing became normal. Twenty-four hours later the baby became cyanotic again. Oxygen was administered and 25 cc. of whole blood taken from the father was administered intramuscularly. The baby soon showed marked signs of improvement, the cyanosis completely disappeared, and the breathing became normal. The baby was discharged on the tenth day, apparently normal.

CONCLUSIONS

1. Intracranial hemorrhage occurs very frequently; from 5 to 15 per cent in the newborn, during or immediately after delivery; and shows a high mortality.

2. It occurs in normal as well as in abnormal deliveries, and is frequently overlooked. This condition occurs most in premature, breech extraction, and in precipitate labors.

3. The treatment is one of prevention. Prophylactic measures during labor and delivery should be instituted.

4. Whole blood from a healthy robust donor given intramuscularly in doses of 20 to 30 cc. (which may be repeated every eight hours if necessary) to any newborn child showing symptoms of intracranial hemorrhage, gives the quickest and best results.

350 Post Street.

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DISCUSSION

L. I. BREITSTEIN, M. D. (350 Post Street, San Francisco)—I heartily agree with Doctor Silverberg's conclusions and wish to emphasize some of his statements; especially those dealing with preventive treatment and prophylactic measures.

Looking at the question as an obstetrician, I firmly believe that our problem can be solved by doing better obstetrics. This means: (1) Employing better prenatal care. Our prospective mother must be in perfect health and kept that way in order to obtain a healthy full-term infant. Starting with a healthy mature infant, the obstetrician must (2) employ better intrapartum care. He must use a technique based on a perfect knowledge of the mechanism of labor, using gentleness and care in order to bring this baby undamaged into the world.

The big cause of intracranial hemorrhage is trauma—birth injury; and it happens during labor or shortly after labor, chiefly in the period of descent. See to it that all conditions, so necessary for descent, have been fulfilled. The cervix must be fully dilated. There must be no disproportion between presenting part and pelvic canal. Watch fetal heart repeatedly all during this stage. Avoid haste. Do not use pituitin. It certainly is responsible for an untold number of intracranial hemorrhage cases. Employ freely prophylactic episiotomies and low forceps when the head is arrested on the floor with no advance. Beware the contracted outlet, just as much an indication for Cesarean section as a contracted inlet.

I cannot agree with the authorities who claim that the use of anesthetics in labor is the cause of intracranial hemorrhage. Morphin-scopolamin or Gwathmey methods may cause oligopnea, even asphyxia, but if kept warm and watched the babies will soon come out of their anesthesia. Undue brute force manipulation in the resuscitations is absolutely contraindicated.

The employment of prophylactic whole blood injections in all cases of difficult labor, whether the baby is born spontaneously or with the use of instruments, is indicated. At Mount Zion Hospital it is a standing order in my service. Our nurse is trained to watch the newborn baby for symptoms of intracranial hemorrhage and to report any suspicious signs, no matter how trivial. Whole blood is easily obtained and repeated injections of big doses may save many a baby.

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JOHN W. SHERRICK, M. D. (350 Twenty-ninth Street, Oakland)—Doctor Silverberg's paper has served to emphasize anew the ever present danger of intracranial hemorrhage in the newborn that every physician must face in his obstetrical work. The incidence that he reports seems high, yet I doubt if it really gives us the true frequency of this complication which probably occurs in a large number of infants without giving rise to immediate symptoms or late sequelae. I believe the condition is met in minor degrees without presenting changes that can be detected by any of our methods of diagnosis.

There is little to add to the presentation of the general causes and predisposing factors to this complication and its treatment, but perhaps I may emphasize certain points. The premature infant in the primiparous patient with rigid cervix and perineum and in the multiparous woman whose labor is precipitate or is complicated by abnormal presentation runs such a risk of intracranial damage that I think the prophy-

lactic use of whole blood may well be used routinely in such cases immediately after birth.

I am very enthusiastic in favor of the prophylactic forceps operation aided by episiotomy in the presence of a rigid pelvic floor with a long and moderately narrowed angle. Properly used it protects the delicate brain tissues of the baby, avoids the danger of undue shock and cerebral hemorrhage and also conserves the maternal strength. One should always exercise a studied slowness and gentleness in every forceps operation, whether it is a prophylactic procedure or one designed to terminate a prolonged labor with fetal embarrassment. Skill and not force is the requirement in these cases. Too often serious cerebral trauma is inflicted by the compression of forceps blades which may be prevented by gauze interposed between the forceps handles; or it may be caused by too forcible and unskillful downward traction which drags the head against the pelvic angle.

Posterior positions require all the skill and assistance that the obstetrician can utilize to protect the child and the mother. When progress is at all delayed I am in favor of manual assistance for securing dilatation of the cervix, followed by rotation and forceps extraction of the baby. While many of these cases will undoubtedly correct themselves and deliver spontaneously if left alone, it means usually a very prolonged and exhausting labor for the mother and for the baby a delivery that is endangered by shock and cerebral trauma. Such a procedure saves hours for the two patients and lessens their dangers.

As Doctor Silverberg emphasizes, prevention is the most important factor in treating these complications. The use of whole blood intramuscularly often accomplishes wonders, but if we can avoid the complication by skill and assistance, so much the better for these little patients.

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JOHN C. DEMENT, M. D. (2525 Fourth Street, San Diego)—Doctor Silverberg's article places a timely emphasis on a condition which is only too often overlooked. The diagnosis is easy only in the frank cases. Those that are more or less masked and appear late are not so easily recognized. These occur usually with hemorrhagic disease, the birth history is often normal, and symptoms may not appear until a bloody stool is seen. In these cases prolonged bleeding time is generally found, and the traumatic element may be slight. As in the cases developing earlier, blood transfusion, using whole or citrated blood, offers prompt relief if done in time.

The author stresses the intramuscular injection of blood. I am inclined to think that the Sidbury method of giving the blood intravenously through the umbilical stump is preferable, especially in urgent cases. If the cord is cut long, as it should be after difficult labors or in suspected cases, the blood may be given directly into the umbilical vein as late as three days after birth. In this way the blood is introduced directly into the circulation, which may be so weak that the intramuscular blood would never be absorbed. Alpha lobelin and carbon dioxid and oxygen mixtures are valuable aids in the treatment of these cases and are preferable to oxygen alone. In extreme cases the blood may be introduced into the fontanelle or directly into the ventricles.

There is very little one might add to the author's comprehensive discussion of the subject. His remarks on the prophylaxis of this condition are especially worthy of careful attention. The question of when and when not to interfere is an ever present one in obstetrics that demands our most careful judgment. As we begin to better recognize these cases of intracranial hemorrhage in the newborn, it appears that there is such a thing as occasionally being too cautious and that certain of these complications may be due to non-interference as well as to instrumental deliveries. Doctor Silverberg has certainly contributed something of decided value in presenting the subject from the viewpoint of the obstetrician.

THE VAN DEN BERGH TEST AND THE ICTERUS INDEX*

By GABRIEL SEGALL, M. D.
AND
M. C. TERRY, M. D.
Los Angeles

DISCUSSION *by Roy W. Hammack, M. D., Los Angeles; Charles L. Bennett, M. D., Los Angeles; Arthur L. Bloomfield, M. D., San Francisco.*

THE study of pathological conditions associated with disturbed liver function has been considerably facilitated recently by the use of certain tests designed to determine the presence and the quantity of bilirubin in the blood in normal or pathological amounts. This paper considers two of these tests, namely, van den Bergh's and Meulengracht's.

EARLY TESTS FOR BILIRUBIN IN BLOOD

Prior to van den Bergh various workers had considered the question of bile in normal blood. Hammerstein in 1878, by oxidation of a chloroform extract of serum, found that most bloods gave a blue or green color like that obtained from bilirubin by the same means. But his method was not delicate enough to detect small quantities with certainty and did not exclude the possibility that other colored compounds, not due to bilirubin, were formed by the reagents employed.

Aube, in 1908, introduced a spectroscopic method by means of which he was able to demonstrate bilirubin in most normal sera. The method is specific for bilirubin and useful as a control, but it is not easily used for quantitative determinations and, because of the large amount of blood required, is not suitable for clinical purposes.

Ehrlich, in 1883, discovered the diazo reaction, which goes by his name, and showed that of all the known bile pigments only bilirubin coupled with diazonium salts in acid solution. But Ehrlich did not work with blood serum.

VAN DEN BERGH'S DIRECT AND INDIRECT TESTS

It was left to van den Bergh to show that Ehrlich's reaction could be employed for the detection of bilirubin in serum, exudates and other protein-rich fluids by a test requiring but little time to do, of great simplicity and of extraordinary delicacy and certainty. Van den Bergh says that the delicacy of the test is such that one part of bilirubin in one and a half million parts of serum can be easily demonstrated and that its specificity can be proved by control chemical tests and by the spectroscope.

Van den Bergh published his observations in 1918 in an extensive monograph entitled "Der Gallenfarbstoff im Blute." The test is, as he says, extremely simple. Briefly it consists in adding freshly prepared diazo reagent, either directly to the clear serum or to the protein-free supernatant fluid, after precipitation by means of two volumes of alcohol, whereupon a red or violet red color

* Read before the Pathology Section of the California Medical Association at its Fifty-Sixth Annual Session, April 25-28, 1927.

appears the depth of which is in proportion to the bilirubin content.

Fresh bile from the gall bladder and serum from patients with obstructive jaundice give the test in the first manner spoken of and also in the second manner. Normal serum and serum from patients with non-obstructive jaundice do not give the test in the first manner but do give it in the second manner. We have, therefore, two ways of doing the van den Bergh test: one known as the direct, the other as the indirect, by means of which we can distinguish between obstructive and non-obstructive jaundice.

Normal serum, when the indirect reaction is used, is found to contain as an average, one part of bilirubin in 500,000 parts of serum. All cases of jaundice of what ever sort can be shown by one test or the other to contain an increased amount of bilirubin; and a subnormal amount has been shown in aplastic anemia, secondary anemia, nephritis and in tuberculosis not complicated by emphysema.

Van den Bergh determined the normal content of serum by comparison with pure bilirubin in alcoholic solution. But since pure bilirubin is not easy to obtain, some other color standard had to be devised if the method was to be practical. Such a standard was found by van den Bergh, first in an ethereal solution of ferric thiocyanate and, later, in a water solution of cobaltous sulphate matching the color obtained from a dilution of one part of bilirubin in 200,000 parts of serum. Taking this depth of color as the unit of measurement van den Bergh showed the normal bilirubin content to be from 0.3 to 0.6 of a unit. The threshold for visible icterus has been found to be about two units and that for bile in the urine, about four units, though these relations are sometimes reversed. We have, therefore, in this fairly broad zone of "latent icterus" between 0.6 of a unit and 4.0 units, a method for the demonstration of a pathological increase of pigment at an earlier stage of disease than was heretofore possible.

SIGNIFICANCE OF VAN DEN BERGH'S TEST

Van den Bergh and others, particularly McNee, have dwelt on the theoretical deductions from these discoveries. It is beyond the scope of this paper to go further into the matter than to point out that two different bilirubin reactions are presented, the direct and the indirect, indicating that bilirubin exists in the blood stream in two different physical or chemical states. It is only fully elaborated bile, the product of normal liver cells and a normal reticulo-endothelial system, which gives the direct reaction; and this reaction is found, clinically, only when obstruction has occurred with consequent reabsorption of bile. That physical or chemical state of bilirubin which can be demonstrated only by the indirect reaction appears to be bilirubin, which is bound to a protein molecule and which, clinically, has failed of complete elaboration somewhere between its hemoglobin origin and the final state of free bile. Such failure may be presumed to be due to damaged polygonal cells of the liver lobule, or to overloading of these cells and the cells of the reticulo-endothelial system by the products of excessive blood destruction. We may note here that the bilirubin produced locally in conditions such as hematomas, pleural and abdominal hemorrhages is demonstrable only by the indirect reaction.

MCNEE'S CLASSIFICATION OF JAUNDICE

Basing his suggestion on the view that the Kuppfer cells of the reticulo-endothelial system elaborate bile pigment, and that the polygonal cells of the liver are chiefly concerned with its passage into the bile capillaries, in which passage, however, the bilirubin is affected in some way as indicated by van den Bergh's work, McNee suggests the following as the best classification of jaundice in the present state of our knowledge:

1. Obstructive hepatic jaundice.
2. Toxic and infective hepatic jaundice.
3. Hemolytic jaundice.

TECHNIQUE OF VAN DEN BERGH'S TESTS

The technique of van den Bergh's test and some of its modifications, such as that of Tannhauser and Andersen, which is the most important, is available in the literature and need not be given here. Our brief account of the method is not meant to cover working directions. Our difficulty in the application of the test has been that of others, namely, the uncertainty of getting a sufficiently close agreement in tint between the test taken, and the standard. We have found that slight adjustment of reaction by means of minimal additions of alcohol-ammonia, too small to affect quantitative relations, improves the matching of color and enables us to read the result with confidence and consistency within the limits of colorimetric determinations. This point is made by van den Bergh, but seems to have escaped most English translators and commentators.

MEULENGRACHT'S ICTERUS INDEX TEST

The other test to which we refer is Meulengracht's, announced by him in 1921 and popularized in this country by Bernheim, who gave to it the convenient name, Icterus Index. For the purpose of this test, Meulengracht assumes that the yellow color of serum is due to its bilirubin content, and he estimates this content by comparison with an artificial standard consisting of a 1:10000 solution of potassium bichromate in water. He takes this standard to indicate fifteen color units, and on this scale finds that normal serum has an index of from one to five such units; that the "first degree of jaundice" (latent jaundice) is encountered between five and ten on the scale, and visible from ten up.

Meulengracht's standard is easy to make, keeps well in the dark, and dilutions of normal and icteric serum match with it, ordinarily, very well. The preparation of the standard solution is not absolutely necessary, since an accurate colored disk for the colorimeter can be had. Serum for

TABLE 1—*Obstructive Cases with Visible Jaundice*

No.	Diagnosis	Van Den Bergh: Direct	Van Den Bergh: Indirect	Ict.-Ind.	Remarks
1	Catarrhal Jaundice	Positive	15.5	34	
2	Cholelithiasis	"	8.8	46	Operated on
3	"	"	Positive	30	" "
4	"	"	"	37, 68	
5	Cholecystitis Adhesions	Delayed	"		
6	Carcinoma Pancreas Diabetes	Positive	15.6 20.5	120	Blood Sugar 361 mg.
7	Ca. Stomach Liver Metastasis	Positive	4.4	25	
8	Ca. Stomach Liver Metastasis	"	9.8	75	Biopsy
9	Carcinoma Pancreas	"	35—	48	

this test must be perfectly clear and free from any trace of hemolysis.

REPORTS OF CASES

These are the two tests we have used in the cases reported on in this paper, out of a larger number from which some omissions had to be made because of insufficient clinical data. We have charted the cases as follows, viz.:

1. Obstructive cases with visible jaundice.
2. Cases of latent jaundice.
3. Hemolytic cases.
4. Miscellaneous cases in which study of liver function was indicated.

TABLE I

A glance at this table shows that we found a positive direct van den Bergh reaction in all cases of obstruction, as has been the experience of all other observers in such cases; and likewise a high icterus index. The high icterus index was strong presumptive evidence that the hypercoloration of the serum was due to bilirubin; practically sufficient evidence in certain of the cases but not positive proof since, conceivably, it might have been due to lutein, carotin, or other of the lipochromes normally or frequently found in serum in varying quantity. The van den Bergh test by virtue of its chemical specificity settled that point and, further and what is of more importance, by the form of the reaction, namely, the direct, showed that the cause of the hyperbilirubinemia was obstruction.

TABLE 2—*Cases without Visible Jaundice*

No.	Diagnosis	Van Den Bergh: Direct	Van Den Bergh: Indirect	Ict.-Ind.	Remarks
10	Chronic Cholecystitis	Positive	Faint	13,6	Dye-X-ray
11	" "	Negative	0.9	10,00	" "
12	" "	Weak delayed	Weak positive	10,00	" "
13	" "	Negative	1.4	8,8	" "
14	Cirrhosis of Liver	Weak delayed	1.4	8,8	Wassermann Neg.
15	" "	Negative	0.9	6,3	

TABLE 2

The second table shows that both tests offered help in cases of latent jaundice, the van den Bergh always being in some degree positive and the icterus index always above normal. It is interesting to see that in a case of cirrhosis of the liver, a second test two months after the first showed a less strongly positive van den Bergh and a lower icterus index concomitant with clinical improvement from duodenal drainage. Here in this group of cases, and presumably in others, one test may be as good as the other, after the hypercoloration is proved by van den Bergh's test to be due to bilirubin and not to some other pigment.

TABLE 3

The third table shows a group of pernicious anemia cases. All of these were clinically typical and some of them extreme, with red cell counts as low as 500,000 and hemoglobin as low as 15 per cent. In one of the patients five tests were made during the course of treatment (by transfusion) and in this patient, as may be seen in the table (19 to 23 inclusive), the van den Bergh reaction varied from time to time in agreement with apparent clinical improvement and improved blood picture. Three of the cases were seen in remission and, as the table shows, might have been mistaken for secondary anemia if seen in this stage for the first time and if dependence had been placed on the blood count and the color index. The indirect van den Bergh reaction at once classified them correctly, as pernicious anemia. It is in this group of cases, namely, hemolytic icterus from whatever cause, that we encounter the form of bilirubin which gives a positive indirect reaction without a positive direct reaction. The icterus index was invariably high in all cases in this group including the three seen in remission.

TABLE 4

In the fourth table are shown eighteen cases of various conditions in which liver dysfunction or damage or a hemolytic process was suspected, partly because of a high icterus index which had been found previously in all of them. The peculiar value of the van den Bergh test is manifested in this group by its exclusion of liver damage or hemolytic process in certain of the cases in spite of the high icterus index. Case 31 is illustrative; clinical symptoms gave reason for suspecting disturbance of liver function and the icterus index was high. The van den Bergh reaction, however, was negative—that is to say, normal. The correctness of the van den Bergh reaction was tested in this patient by another highly sensitive method for the detection of liver damage, namely, Rosenthal's dye test, the result of which was the excretion of the dye as follows: present after five minutes, 5 per cent; after fifteen minutes, a trace only; after half an hour, none—in other words, a normal result in agreement with the van den Bergh reaction. The ultimate diagnosis in this patient was chronic appen-

dicitis, a conclusion which has been justified by several months' observation since these tests were made.

Case 35 is another one in point. The van den Bergh reaction was negative, but on the basis of clinical symptoms and a high icterus index a diagnosis of chronic cholecystitis was made; at operation the next day the gall bladder was found to be normal. It was a case of chronic appendicitis.

Three cases in this fourth table suggest that the icterus index was right and the van den Bergh test wrong, namely, cases 32, 33 and 36, or at least that the icterus index method was successful in indicating liver pathology and the van den Bergh test failed. Plainly this is true so far as the failure of the van den Bergh test is concerned in these three cases, but a glance at a larger number of cases in this group in which the two tests did not agree will show that a high icterus index is sometimes merely incidental and suggests that it may have been so in these cases. It is a fact that the van den Bergh test gives us little or no help in the group of toxic and infective jaundice cases, the common run of cases in which help would be most desired. This is its shortcoming. On the other hand the icterus index carries with it the danger of "false positives," and perhaps more so in this part of the world where we are permitted such a full and varied diet.

The direct van den Bergh reaction was negative in all cases in the fourth group as would be expected since obstruction was not in question in any of them.

The secondary anemia cases in the fourth table show negative direct reactions and either normal or subnormal indirect reactions, in agreement with the reported findings of others; the differentiation from pernicious anemia is very clear.

Three cases included in the fourth table are there chiefly because of their clinical interest: one a case of acute lymphatic leukemia which came to autopsy; one a case of Hodgkin's disease; and one a case of Addison's disease. As was to be expected all three gave negative van den Bergh reactions.

TABLE 3—*Hemolytic Cases*

No.	Diagnosis	Van Den Bergh: Direct	Van Den Bergh: Indirect	Ict.-Ind.	Remarks
16	Pernicious Anemia	Negative	1.5	42	
17	" "	"	8.3		Red cells 525,000 Hemoglobin 32
18	" "	"	2	15	
19	" "	"	4.8	30	Red cells 7,000 Hemoglobin 18
20	" "	"	2.4	10.7	Transfusion 5 days previously. Red cells 120,000 Hemoglobin 23
21	" "	"	Positive	15	Red cells 2,020,000 Hemoglobin 48
22	" "	"	2.9	12.5	Red cells 1,880,000 Hemoglobin 38
23	" "	"	1.4	21	Red cells 1,970,000 Hemoglobin 38
24	" "	"	Positive	7.5	Red cells 2,020,000 Hemoglobin 48
25	" "	"	2.5	16.6	Red cells 1,570,000 Hemoglobin 38
26	" "	"	1.1		In remission: Red cells 3,800,000 Hemoglobin 67 Color index 0.9
27	" "	"	2.3	10	Red cells 2,100,000 Hemoglobin 60
28	" "	"	0.9	10	In remission.

TABLE 4—*Miscellaneous*

No.	Diagnosis	Van Den Bergh: Direct	Van Den Bergh: Indirect	Ict.-Ind.	Remarks
29	Flagellatae Infection	Negative	Normal	15	
30	" "	"	"	10.7	Red cells 4,330,000 Hemoglobin 85
31	Chronic Appendicitis	"	"	15	Rosenthal dye test
32	" "	"	"	17	Operated on: Appendicitis and 1 stone in thickened gall bladder.
33	Chronic Cholecystitis	"	"	12	
34	Syphilitic Hepatitis	"	1.6	12.5	Wassermann 4+
35	Chronic Cholecystitis	"	Normal	15	Operated on: Gall bladder normal Chronic appendicitis
36	Liver Cirrhosis	"	"	10.7	
37	History of Malaria	"	2.8	15	Mild jaundice Urobilinogen in urine.
38	" "	"	3.3	12	Red cells 4,500,000 Hemoglobin 90
39	" "	"	2.9	15	
40	Secondary Anemia	"	Normal	12.5	Red cells 2,210,000 Hemoglobin 40
41	" "	"	Below Normal	7.5	Red cells 2,800,000 Hemoglobin 55
42	Chronic Nephritis Secondary Anemia	"	"	6.24	Red cells 2,530,000 Hemoglobin 42
43	Acute lymphatic Leukemia	"	Normal		
44	Hodgkins disease	"	"		
45	Addison's disease	"	"	8	
46	No definite symptoms	"	"	12	Red cells 4,280,000 Hemoglobin 85

SUMMARY

A series of cases is reported comprising (1) obstructive visible jaundice, in which the van den Bergh test and the icterus index agree; (2) latent jaundice cases, in which the two tests agree; (3) pernicious anemia cases, showing the same agreement; (4) a variety of clinical cases, in some of which the two tests did not agree.

CONCLUSIONS

On the basis of the work here reported we conclude (1) that both van den Bergh's test and Meulengracht's test (the icterus index) are of clinical value; (2) that, whatever its shortcomings, the van den Bergh test is not misleading; (3) that the icterus index, since it does not distinguish between bilirubin and other substances

which color blood serum, may be misleading unless it is controlled by the van den Bergh test or some other specific test for bilirubin; (4) that the van den Bergh test is an aid to the differentiation between obstructive and non-obstructive jaundice, in which respect the icterus index is of no assistance.

609 Brockman Building.
921 Consolidated Realty Building.

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DISCUSSION

ROY W. HAMMACK, M. D. (1003 Pacific Mutual Building, Los Angeles)—Doctors Segall and Terry have given us an interesting and instructive comparison of these two tests for bile pigment in the blood. All will agree, I believe, that the van den Bergh test gives us more information than the icterus index though at the cost of somewhat more effort.

I was surprised to see in the report so many instances of high icterus index in which the presence of bilirubin was not shown by the van den Bergh test. This emphasizes the importance of controlling the high icterus index by a specific test for bilirubin. Provided it is so controlled I believe that the icterus index is a more accurate quantitative test and is more easily performed than the quantitative van den Bergh.

Our knowledge of jaundice has been greatly increased by the study of the blood by these methods and this compartive study is no small contribution to that knowledge.

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CHARLES L. BENNETT, M. D. (607 South Hill Street, Los Angeles)—This paper by Segall and Terry calls attention to a particularly valuable quantitative test for bilirubin in the blood stream. Jaundice means increased bilirubin in the blood, and the proper interpretation of the amount and kind means much in exact diagnosis of forms of anemia and obstructive diseases of the biliary ducts. The indirect test is always positive when bilirubin is present in the blood stream and is valuable in differentiating pernicious anemia with its extensive destruction of red blood cells. When bilirubin passes through the polygonal hepatic cells its molecular structure is changed and here the direct van den Bergh test is positive and, when present, indicates resorbed and molecularly changed bilirubin due to biliary duct obstruction. Attention should be called to the fact that jaundice of the "invisible variety" (*i. e.*, before becoming evident to ordinary sight) can be diagnosed. Also the van den Bergh is not a mere color test as is the icterus index. The latter gives a positive reaction with other pigments, while the van den Bergh is a definite chemical reaction for bilirubin, with all the advantage accruing from the fact that it cannot be confounded with any other substance. This paper is timely in its emphasis of a specific procedure, harmless for the patient, and simple for the clinician.

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ARTHUR L. BLOOMFIELD, M. D. (Stanford University School of Medicine, San Francisco)—Doctor Segall's and Doctor Terry's observations are in accord with those of other workers. In regard to the value of the two tests for the detection of hyperbilirubinemia there is now quite general agreement that the van den Bergh is more delicate and accurate. Whenever this can be performed it is undoubtedly the method of choice, and the icterus index should be reserved as a simpler and a less accurate method. The technical difficulties connected with the van den Bergh test are, however, considerable, and unless the procedure is performed with the greatest care, it may be more satisfactory to employ the simpler though less accurate method.

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DOCTOR SEGALL (closing)—Regarding the relatively large number of cases showing a high icterus index as against no abnormal quantity of bilirubin by the van den Bergh test in the same case, this is precisely what we want to bring out: that the van den Bergh test is a specific qualitative and quantitative test for bilirubin. The icterus index is not specific for bilirubin. The only way possible at present to correct misleading returns by the icterus index method, is by use of the van den Bergh test, properly done. We therefore consider the icterus index as less accurate. As to technical difficulties in doing the van den Bergh test, we have been able to overcome them.

LIPIODOL—ITS USE IN PULMONARY SUPPURATONS*

By E. RICHMOND WARE, M. D.
Los Angeles

DISCUSSION *by William C. Voorsanger, M. D., San Francisco; Ernest H. Falconer, M. D., San Francisco; A. L. Bramkamp, M. D., Banning.*

A SATISFACTORY clinical and anatomical diagnosis in a large number of suppurative conditions of the lungs has always been a difficult problem. Lung abscess and bronchiectasis are frequently suspected from the history alone, and physical and routine roentgenological examinations usually give valuable additional information. However, the accurate localization of the pathology and the discovery of all the involved areas have often been impossible, with the result that attempts at treatment by the various methods at our command have not been very encouraging. In lipiodol, or iodized oil, we have a non-irritating fluid substance which can be safely introduced into the tracheobronchial tree. It is opaque to the x-ray and will clearly demonstrate the outline of intrapulmonary cavitation in the bronchi themselves, or in the various portions of the lung parenchyma which have direct connection with the larger bronchi.

LIPIODOL

Lipiodol is a golden yellow, oily substance, fairly viscid, becoming more fluid at body heat, with a content of 40 per cent metallic iodin. The iodin is in a close combination with the oil of poppy seed and fails to give the usual starch reaction. It has a characteristic odor, and on standing undergoes decomposition, with the liberation of free iodin, as indicated by the appearance of a brownish tint. Such a specimen is unfit for use.

HOW LIPIODOL IS USED

In addition to its use in the respiratory tract it has been employed to demonstrate the spinal canal, the vas deferens, the seminal vesicles, the patency of the fallopian tubes, the size and character of

* Read before the California Medical Association Section on General Medicine at the Fifty-Sixth Annual Session, Los Angeles, April 25-28, 1927.

the sinuses of the head, and the course of various tracts connected with areas of chronic suppuration, as well as cold abscesses in numerous locations. Its introduction into the bronchial tree can be by the supraglottic, transglottic, infraglottic, or bronchoscopic route. The transglottic and infraglottic methods have not been employed in any of the cases of this series. It seems hardly necessary to introduce a catheter between the vocal cords as is necessary in the transglottic method; and the infraglottic approach pierces the cricothyroid membrane and injects the oil directly into the trachea by means of a curved metal cannula similar to the type used in abdominal paracentesis. The supraglottic method has been employed in the greatest number of cases, and causes very little inconvenience to the patient. After moderate local anesthetization of the pharynx, vocal cords, and upper portion of the trachea, the lipiodol is slowly dropped upon the open glottis during inspiration. If the patient refrains from coughing or swallowing, it readily descends the trachea and will enter the most dependent portion of the lung. Fortunately most of the diseased area is located in the lower lobes, and the area to be filled can be selected by tilting the patient to the involved side. The upper lobes may be fairly well demonstrated by tipping the table so that the head is lowered and the feet elevated. The amount used varies from 10 to 35 cc., and it is best to attempt to fill no more than two lobes at a single sitting. A roentgenogram should be taken at once, before the patient has coughed. Lateral or oblique as well as anteroposterior views should always be included. The bronchoscopic method has given us some of our best pictures, especially in cases where a large cavity exists. It has the advantage of introducing the lipiodol directly into a specific bronchus, permits a view of the mucous membrane and allows the aspiration of pus or mucus, which often acts as a plug in the very tube which one is most anxious to outline. However, the passage of a bronchoscope, even in the most skillful hands, represents an ordeal for the patient, and its use must be confined to a small group of highly trained men. I feel that satisfactory results can be obtained by the simpler supraglottic injection in almost all cases of bronchiectasis. However, in lung abscess it is frequently impossible to get a proper filling by the supraglottic method, when a very good result may be obtained by the use of the bronchoscope.

Fig. 1—Lipiodol injection of both lower lobes. Normal picture.

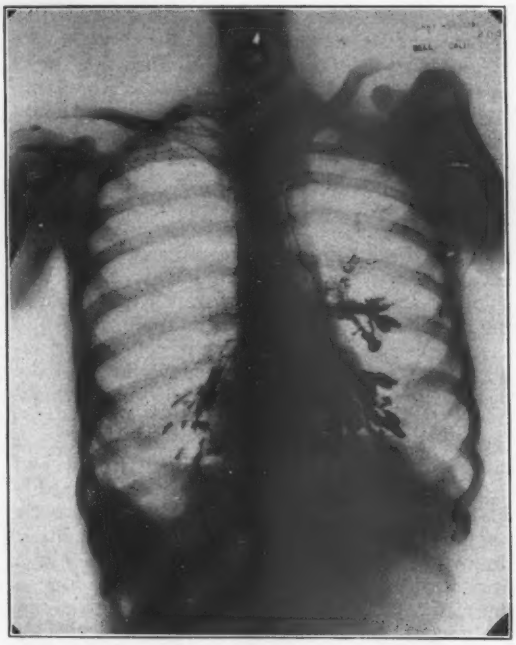

Fig. 2—Lipiodol injection of both lower lobes. Extreme degree of bronchiectasis. Bronchiectatic cavities filled with lipiodol. Trachea well outlined, giving the so-called "bunch of grapes" appearance. (Courtesy of Dr. O. H. Homme.)

CHIEF DIAGNOSTIC VALUE

Lipiodol's chief diagnostic value is seen in suppurative conditions such as bronchiectasis, lung abscess, and empyema. It has also been used to determine the extent and value of lung compression by pneumothorax or thoracoplasty, as well as to locate any additional pathologic areas in cases of pulmonary tuberculosis. It must be remembered that a large part of the pulmonary field at the left base is obscured by the heart shadow; also, the diaphragm outlined radiologically indicates merely its extreme center and highest portion, as it is actually a true dome, higher in the center than peripherally. There is a considerable amount of pulmonary tissue which contains numerous fair-sized bronchial radicles below the level of the outline of the diaphragm. Fairly extensive disease may be present in this area as well

as behind the heart and yet not be suggested in the average stereoscopic plate of the chest.

The normal bronchial outline, when filled with lipiodol, can best be described as a tree with its single large trunk breaking up into smaller branches, which terminate in the spotty foliage represented by the alveoli. The large trunks usually are not filled solidly, but their walls are outlined by two parallel lines which, in the smaller bronchi, are fused into a solid column. This in turn breaks up into sharply outlined linear shadows that terminate in the speckled and splotchy areas of the lung parenchyma. Coughing expels a part of the oil from the bronchi into the alveoli and results in interruption and breaking of the solid bronchial columns. The lipiodol disappears quite rapidly from the bronchi themselves, but remains for several weeks and sometimes two or three months in the alveoli. Here it loses its dense and sharply outlined shadow and often has an appearance very suggestive of a diffuse and active pulmonary tuberculosis, frequently resembling a miliary infection. The lymphatic drainage of the oil toward the glands at the hilum occasionally gives them a very dense shadow in the picture which may suggest calcified glands at the lung roots. Such pictures might well give an erroneous interpretation to a chest plate if the observer were unacquainted with a history of lipiodol injection.

The earliest indications of bronchiectasis are a widening of the bronchial columns, which become fusiform in shape. These later take on a bulbous character, and in extreme cases have a so-called glove-finger appearance. Occasionally the shadow of several closely associated bronchi looks like a cluster of grapes. These are frequently superimposed upon each other to give the appearance of a single large cavity. However, if views are taken in more than one plane this mistake may be avoided. Cylindrical and large sacculated cavities are other characteristic types of advanced bronchiectasis.

Large abscess cavities are frequently not single, and bronchiectasis is often an associated complication. This explains the not uncommon failure of a cure following the aspiration and drainage of a cavity. A type of abscess which is difficult to demonstrate either by the usual roentgenogram or by lipiodol injection is the narrow-necked abscess described by H. C. Ballon. Here the sputum represents merely an overflow, and the actual cavity is probably never completely emptied. However, some of these cases can be injected if bronchoscopic suction is employed before filling with the oil.

LIPIODOL IN PULMONARY TUBERCULOSIS

There is a difference in opinion as to the advisability of injecting lipiodol in cases of pulmonary tuberculosis. Most authors have avoided its use in these cases, but it has been frequently employed in Archibald's clinic, and Ballon endorses its use in certain types of cases. All agree that it should be avoided in toxic cases of pulmonary tuberculosis, with progressive lesions of the exudative type. In patients with good fibrosis, oil injection may be advisable to determine a supplementary bronchiectasis that is often unsuspected and may be responsible for a large part of the persistent catarrhal symptoms. Sometimes cavitation or bronchiectasis that has not been collapsed by a thoracoplasty can be demonstrated and localized by lipiodol, permitting further operative procedures to close the remaining areas of suppuration. In one of our cases the oil produced a definite increase in cough and expectoration, with the appearance of tubercle bacilli in the sputum. These had never been found previously in a long series of examinations. However, the increase in symptoms persisted only a few weeks and was not permanent. Many cases of advanced pulmonary tuberculosis have dilated bronchi and secondarily infected cavities, which may not be seen in the usual roentgenogram. The presence of such infection in the opposite lung would be a distinct contraindication to compression by pneumothorax or thoracoplasty, and might be brought out only by lipiodol injection.

If there has been a recent lung hemorrhage from tuberculosis or from any other cause, injection should be postponed for at least a week. I have seen no serious results from lipiodol, and any toxic absorption can usually be traced to swallowing during supraglottic injection or to ingesting some of the coughed-up oil which has already entered the pulmonary passages. Doctor Pritchard of Battle Creek reported in a personal communication that he had seen two cases of severe diarrhea which followed the use of 40 cc. We have had one case of diarrhea after 30 cc. were injected in a patient who had a larve cavity in addition to bronchiectasis. This lasted for about two weeks, but was accompanied by a concomitant improve-

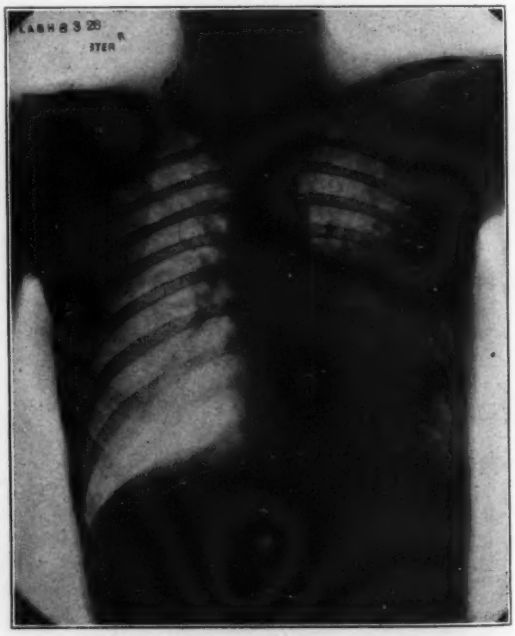

Fig. 3—Intercommunicating bronchiectatic abscess cavities outlined by lipiodol in left lower lobe. Extensive surrounding pneumonitis.

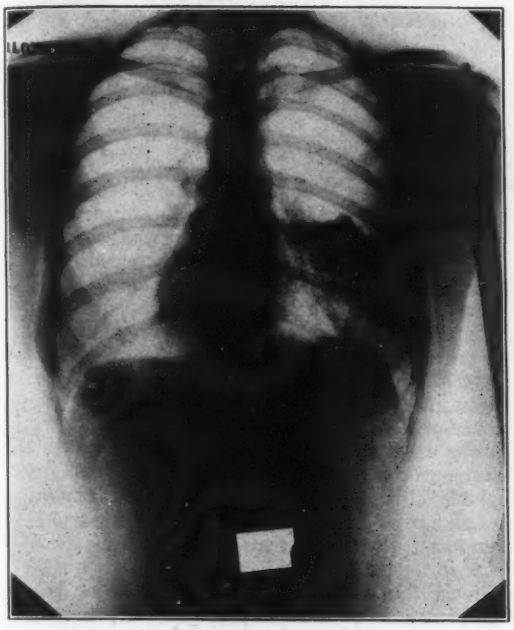

Fig. 4—Cavity filled with lipiodol thought to be non-tuberculous. Following injection tubercle bacilli appeared in sputum. None found previously.

ment in every other respect. I have read of two patients developing headache, malaise, coryza, and conjunctivitis, and an occasional morbilliform rash has been reported. The only two fatalities I have been able to discover were due to myocardial failure in one instance, and in the other the lipiodol was injected in a patient seriously ill with an exudative type of tuberculosis. On the whole, disturbing or alarming reactions have been extremely rare.

COMMENT

Lipiodol was first used purely for its diagnostic value in demonstrating the character and position of cavities and sinuses in various areas. However, it is becoming evident that it has decided therapeutic properties. We have had striking examples of this, and are employing it in cases of bronchiectasis with injection at intervals of one or two weeks. The patient mentioned above, in whom lipiodol produced a persistent diarrhea, showed a definite and unexpected improvement following a single injection, which demonstrated a large cavity with several smaller bulbous bronchial enlargements. From a progressive septic state the entire picture changed, with a disappearance of fever, leukocytosis, and anemia, reduction of cough and sputum, and a progressive gain in weight and strength to normal. Enough time has not elapsed to gauge the full value of lipiodol in the treatment of lung suppurations. In well-established lung abscesses of considerable size there can probably be very little therapeutic result; however, it is evident that it is of undoubted value in cases of multiple bronchial dilations which are not too extensive. Heretofore the outlook for these patients has not been encouraging. Pneumothorax and phrenecotomy have not been satisfactory, and thoracoplasty is a radical operation with high mortality and attended by considerable permanent deformity. All of these three procedures are applicable to unilateral cases only. Postural drainage and change of climate have been about the most successful recommendations we have been able to offer. In lipiodol we have a remedy which is safe and, in addition to its diagnostic value, seems to possess very striking therapeutic properties.

1052 West Sixth Street.

DISCUSSION

WILLIAM C. VOORSANGER, M. D. (490 Post Street, San Francisco)—Lipiodol or iodized oil, first introduced by Siccard to diagnose lesions of the spinal cord and then popularized by Forestier in pulmonary conditions, has proven a valuable diagnostic aid. I am glad to hear Doctor Ware deprecate the transglottic method, although I have seen Forestier use this method without any discomfort to the patient. It requires skill and practice, however. Armand Delille uses the small canula in children, piercing the cricothyroid membrane without discomfort to the patient. Chevalier Jackson, expert with the bronchoscope, employs this instrument in the use of lipiodol. I agree fully with Doctor Ware that lipiodol can be introduced very easily with a straight canula attached to an ordinary 20 cc. syringe, often by simply anesthetizing the pharynx. This method requires but moderate skill, and practice and excellent roentgenograms can be obtained with it. In localizing lung abscess I would suggest first doing a partial pneumothorax and then introducing lipiodol. In this way the clear and more definite walling off may be obtained.

I cannot agree with Doctor Ware that lipiodol is of any diagnostic value in pulmonary tuberculosis. It rarely, in this disease, gives any information not obtainable by x-ray plates and may cause great damage, particularly in inducing hemorrhage. Lipiodol has been of great aid in demonstrating bronchiectatic cavities and dilated bronchi back of the heart shadow, and should be primarily reserved for non-tuberculous pulmonary conditions. Doctor Ware's observation that no serious results ensue from the use of lipiodol coincides with the opinion of most men who are using it routinely. Toxic absorption usually happens when lipiodol is swallowed, the oil disintegrating in the stomach and liberating iodin. If the stomach is fluoroscoped after the introduction of lipiodol we can readily see if any has been swallowed and if so by immediately washing it out prevent absorption. Lipiodol often stays in the lung tissue months or years without apparent damage.

Regarding the therapeutic value of iodized oil reports to date are anything but conclusive. Armand Delille in treating bronchiectasis in young children has noticed a definite cessation of cough after the introduction of lipiodol. This may be due to the filling of a small cavity with thin walls. If the oil is retained long enough the cavity may close. This would hardly apply to the bronchiectatic cavity of an adult where the walls are much thickened. I have personally never seen a definite therapeutic effect which could be attributed to lipiodol *per se*. Still it has possibilities, and we should observe experiments in its use with open minds and unbiased judgment. Doctor Ware has presented this entire subject in an excellent manner, and no doubt his experiences will stimulate a wider use of this valuable diagnostic method.

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ERNEST H. FALCONER, M. D. (384 Post Street, San Francisco)—Lipiodol has now been in use long enough to enable one to know something of its limitations, as well as its possibilities. About one year ago, when in Montreal, I saw some films of cases that had been injected by H. C. Ballon with the bronchoscopic method. These films outlined bronchiectatic dilatations that had been entirely missed by the supraglottic

method. Success in certain cases undoubtedly requires the use of the bronchoscope, plus skill in its use. The supraglottic method, on account of its simplicity, has a much wider range of usefulness.

Doctor Ware has covered the uses of lipiodol well, also pointing out that it is toxic in an occasional case. As a result of the widespread use of this agent we are getting an increasing number of reports of toxic reactions, some of them quite severe.

As to the therapeutic value of lipiodol in pulmonary suppurations, opinion seems much divided. I do not feel at this time very much encouraged over its therapeutic possibilities. One should, however, await more data on this particular phase of its use.

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A. L. Bramkamp, M. D. (Banning)—The use of the x-ray, especially stereoscopic, in the diagnosis of the chest condition marked a great advance. For one thing, it showed some of the limitations of physical examination. In the use of these two methods of examination, x-ray and physical, however, each is a check on the other, and best results follow the judicious use of both. Introduction of the method of lipiodol injection into pulmonary areas for diagnostic purposes has carried diagnostic efficiency still further, and has demonstrated additional limitations not only in physical examination of the chest, but has also shown surprising limitations in even the stereoscopic x-raying of the lungs; particularly as to conditions below the top of the diaphragm and behind the heart. There is now to be had assurance as to actually existing conditions in the pulmonary area where formerly guesswork obtained to a considerable extent. Even the most skilled in physical examination and in x-ray find the possibilities of definite diagnosis in certain cases wonderfully extended. All this has been brought out in Doctor Ware's excellent paper, and in previous discussions.

As to methods of introducing lipiodol, or any substance that may displace it, into the lungs, it would seem the bronchoscopic method comes nearest being the ideal, since it makes possible most certain and accurate placing of the opaque substance.

However, if the use of lipiodol is to find the general and perhaps frequent application to which it now seems entitled, some method or methods requiring less special equipment and training must be available. This need seems to be met in the supraglottic and the transglottic methods, which the training of any throat or chest specialist and that of many other practitioners enables them easily to master, and which gives excellent results.

The possibilities and limitations of lipiodol injections are rapidly being established. There are also suggested possibilities of its therapeutic value.

As to the use of lipiodol in cases of tuberculosis, Archibald, Iglauer, Bronfin, and others, regard it as innocuous, except in cases with fever of recent hemorrhage. Iglauer has made this noteworthy of observation: that in two cases of chronic pulmonary tuberculosis in which sputum examination had been negative repeatedly for a long time, promptly after the injection of lipiodol numerous tubercle bacilli were found. The subsequent course of these cases was not influenced adversely.

Mosher calls attention to inundation, or saturation areas, that he calls false abscess, resulting from bronchoscopic injections of lipiodol, that closely simulate real abscess. Here the parenchyma is flooded by the injection. He suggests that weaker injections of lipiodol must be used or, better still, that the oil must be introduced with a nebulizer, and he is working on this phase of the problem.

These facts need emphasis: first, that lipiodol must be adequately introduced; second, that there must be competent interpretation of the films.

SINUS SUPPURATIONS—THEIR SURGICAL TREATMENT *

By J. Frank Friesen, M. D.

Los Angeles

Discussion *by Edward C. Sewall, M. D., San Francisco; F. H. Brandt, M. D., Los Angeles, Frank A. Burton, M. D., San Diego.*

IN reviewing the literature on the surgical treatment of frontal sinus suppurations, one is impressed by the fact that there is a great difference of opinion in the procedure of treating these infections. Certain rhinologists seem universally successful with the intranasal operation and are apt to criticize colleagues who prefer operating by the external route. Fortunately most acute frontal sinus infections are of a mild character and recover without surgical intervention. In the majority of those who require surgical aid effective drainage can be insured by enlarging the frontoethmoidal passage intranasally; this should be the operation of choice in the uncomplicated simple suppurative process. Structural alterations in the anterior end of the middle turbinate, polypi, granulations, or a nasal septum deviated to the affected side, may interfere with proper drainage and should be corrected.

INDICATIONS FOR EXTERNAL OPERATION

The question arises as to when external operation is to be preferred. The anatomical and pathological condition of the sinuses should be studied from all angles. Sinuses do not drain well if the roentgenograms show them to be large, with backward extension along the orbital wall. Incomplete septa give rise to the formation of pockets and recesses, which interfere with the cure in chronic suppurations. Pathologic changes affecting the mucous membrane, periosteum, and bone, call for eradication of the lesion by an external method. Conservative measures should not be attempted in the presence of cerebral and orbital complications. Conservatism is often used to cover a timidity or a surgical insufficiency. An external operation is not a dangerous procedure, nor is it necessary to produce an unsightly scar. Success depends upon good surgical judgment and employment of the proper technique in the type of operation performed.

TYPES OF OPERATION

When only one frontal sinus is affected the Lynch[1] operation has given me good results. In one of the cases here reported, where an attempt had been made to carry out the Lynch technique, failure was due to incomplete removal of the anterior ethmoid cells, and to a collapse of the outer wall of the nasofrontal passage, as the result of a large resection of the orbitonasal bones.

Another operation commonly used is the Killian,[2] but so many failures are reported that it is in disrepute. The aim in Killian's operation is to remove all diseased tissue and bring about an

* Read before the Eye, Ear, Nose, and Throat Section, California Medical Association, at its Fifty-Sixth Annual Meeting, April 25-28, 1927.

obliteration of the sinus. This is fairly successful in a small sinus, but in large cavities the result is an incomplete obliteration, closure of the nasofrontal canal and reinfection.

In the three cases reported here I chose the Lothrop[8] operation, because both sinuses were diseased and complicated with fistulae. The Lothrop operation insures success by establishing better drainage than can be obtained by other methods. This is accomplished by a judicious removal of the nasal floor of the sinus, which consists of a dense mass of bone directly behind the base of the nose, made up in part by the frontal, nasal, and the nasal process of the superior maxillary bones. This interfrontal body is too dense and inaccessible to be removed with a curette or the ordinary bone instruments. Lothrop advised using burr drills; this, however, is not practicable in most operating rooms. I have had success in using a right-angled bone-cutting forceps. When both sinuses have been involved, part of the perpendicular plate of the ethmoid, the upper anterior part of the nasal septum, was also removed. The operation is a safe procedure if the anatomy of the floor is thoroughly understood, and the posterior angle of the sinus constantly avoided. The frontal ostium marks the safety zone into which a probe is passed and left *in situ* as a guide. The region posterior to the ostium is in close proximity to the cribriform plate. The anterior ethmoids are part of the floor of the nasal portion of the frontal sinus, hence suppurations usually coexist in both sinuses and in nearly all instances were removed. The posterior ethmoids and turbinates were left, and the function of the nose was not disturbed. In some of the following cases the antrums were diseased or acted as a reservoir and were drained.

CASE REPORTS

Case 1—J. W., a man aged 50, three days before entrance into the hospital, developed an acute head cold with a severe headache and pain in the frontal region over the right eye. On May 12, 1926, he was admitted to the hospital with the following findings: marked edema and tenderness over the region of both frontal sinuses; an acute inflammatory swelling of the right orbital tissues near the internal canthus, which was followed by an orbitofrontal fistula the following day; a profuse purulent secretion from both nasal passages, the right being completely blocked by a deflected septum. The diagnosis of acute empyema of both frontal sinuses was confirmed by roentgenograms. Both maxillary sinuses were likewise affected.

On May 15, three days later, the Lothrop operation was performed. The right sinus was opened by enlarging the frontal ethmoidal fistula and removing the thin necrotic bone of the orbital portion of the floor of the sinus. The interfrontal septum had a perforation, and both sinus cavities were filled with pus. The floor of both sinuses was removed and the sinuses were curetted. A quarter-inch rubber tube drain was inserted into each sinus through the nasal passages and left in position for several days. The external wound was closed, but due to the virulence of the infection, the tissues began to slough. The opening, when sutured, healed properly. The maxillary sinuses were treated by draining through an opening under the inferior turbinate. This fulminating type of infection was caused by the staphylococcus aureas. The patient was examined again six months after the operation. He was practically free from any nasal symptoms. The vision was normal in both eyes. He did not have any of the untoward sequelae that sometimes follow the radical frontal operation.

Case 2—A girl, aged 15, was admitted to the hospital on February 17, 1926. Two weeks before entrance a swelling commenced in the orbital tissues of the right side. The swelling gradually became worse, opened, and discharged pus. The patient was referred to the eye service with the diagnosis of an orbital abscess. Further examination revealed an empyema of both frontal and maxillary sinuses. The antrums were drained through an intranasal window operation. As both frontal sinuses were affected, with a frontoorbital fistula on the right side, the external operation according to the method of Lothrop was done on March 4, 1926. The fistulous tract from the right orbit into the sinus was enlarged and numerous sequestra of bone removed from the orbital floor of the sinus. The interfrontal septum had a large opening and both sinus cavities were filled with pus and polypoid material. The nasal floor of both frontals, consisting of a hard mass of bone, and the upper part of the nasal septum was removed with bone-cutting forceps. A fenestrated rubber drainage tube was placed in the nose and made to extend into the right frontal sinus. The external wound was closed and healed promptly. The organisms in this infection were the staphylococci and the pneumococci. The patient was discharged April 18, and two months later reported that she was free from nasal and eye symptoms.

Case 3—This case presents the difficulties encountered in curing an obstinate frontal sinus infection and hence will be considered in more detail.

History—A woman, aged 60, developed an acute fulminating left frontal sinusitis. She consulted an otolaryngologist, who removed the anterior part of the left middle turbinate to promote drainage. After three weeks an intranasal frontal sinus operation was performed which gave her some relief. The drainage, however, proved inadequate and the nasofrontal opening was again enlarged. After four months of intranasal surgery and treatment, swelling and redness made its appearance at the inner left orbital region and she was referred to the Los Angeles General Hospital.

Examination—There was a suppurative sinusitis involving the left frontal, ethmoid and maxillary sinuses. The left orbital tissues in the region of the ethmoid area were red and edematous, and in a few days began to break down, with discharge. The general examination of the patient was negative.

Operation No. 1. On September 2, 1925, an external operation of the Lynch type was performed under ether anesthesia. A curved incision was made under the supra-orbital margin and along the side of the nose, the fistulous opening was enlarged, the anterior ethmoidal cells were removed, the frontal sinus was curetted, and the nasofrontal channel was enlarged. The external wound was closed. Daily nasal irrigations were instituted and the patient showed a gradual improvement, with external wound healing. In one month, however, the frontal sinus again commenced to drain through the orbital fistula, and the patient relapsed into her former condition. The pain and swelling about the eye increased. The sinus was then irrigated daily through the external opening.

Operation No. 2. On October 7, 1925, under general anesthesia the left frontal was opened through the anterior wall, leaving a bridge of bone and periosteum, after the method of a modified Killian. The cavity contained polypoid material and pus. There was a communication with the right frontal, which also was infected and contained pus. The septa and the granulations and mucous membrane of the cavities were removed. The right frontal opening into the nose was enlarged and the external wound kept open with a rubber drain into the nose. The sinuses were irrigated through the external opening, and the patient was fairly comfortable. At frequent intervals the orbital tissues would show signs of reinfection from

the continuous discharge. The nasofrontal opening gradually filled in with granulations. A number 5 frontal sinus dilator was readily passed into the sinus; but on withdrawal the opening collapsed, due to the previous naso-orbital bone resection, and to the falling in of the outer nasal wall. The sinus cavities were irrigated, the granulations in the frontal opening were cauterized for several months, and still there was no improvement in the patient's condition. The drainage seemed to be inadequate, and another operation was advised.

Operation No. 3. On February 11, 1926, the patient then came under my observation. I chose the Lothrop technique as giving the best drainage in a bilateral infection. The patient was again etherized. The fistulous opening on the left side was enlarged, so that it was possible to inspect thoroughly both sinus cavities with a reflected light. By means of Coakley's curettes, polypoid and granulation tissue was exenterated. The interfrontal septum had been partially removed in a previous operation. The nasal floor between both sinuses and the upper part of the nasal septum were taken out with bone-cutting forceps, the nasal floor consisting of a mass of dense bone, being part of the frontal, nasal and the nasal process of the superior maxillae. This procedure made one common opening into the nose from both sinus cavities, providing free drainage. A quarter-inch rubber drain was inserted into the left sinus through the nose and left in position for five days. The external wound was closed. The posterior ethmoids and middle turbinates were not disturbed. A few weeks later the left antrum was drained below the inferior turbinate. The postoperative care consisted in cleansing irrigations. The frontal cavities were readily accessible to treatment; the opening providing free drainage and ventilation at all times. The patient complained of a diplopia and a numbness over the brow which gradually disappeared. The patient was seen a year after the operation. A probe could be readily passed into each frontal sinus, and she was free from all nasal symptoms. The vision in both eyes was normal.

SUMMARY

The striking feature of these cases was the immediate closure of the fistulae, which proves that reinfection is due to obstruction of the nasofrontal canal.

By establishing free drainage and making the sinus accessible to intranasal treatment, successful results will follow.

The Lothrop operation is to be especially recommended, as he stated in his original article, for (1) cases in which previous operations have failed; (2) those in which both sinuses are diseased; and (3) sinuses with fistulae.

614 Merritt Building.

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DISCUSSION

EDWARD C. SEWALL, M. D. (Stanford University Hospital, San Francisco)—I congratulate Doctor Friesen on the excellent results that he reports. The last case is especially noteworthy and the result a confirmation of his judgment in the selection of the type of operation that he employed.

I agree with his views as to the relative value of intranasal and extranasal work. Where intranasal methods will suffice they, of course, should be chosen. With modern clinical methods of diagnosis, emphasizing particularly the use of stereoscopic x-ray pictures from different angles, certain cases are known to be unsuited for intranasal work.

In regard to Killian and his operation, we must thank him for having introduced most important principles of surgical drainage. Most of the operations employed are modifications of his method. Lothrop added a very important feature which helps to overcome the poor drainage apt to follow where the removal of bony walls allows the falling in of the soft tissues.

While Doctor Friesen mentions only general anesthesia, I presume that he uses local anesthesia in suitable cases. I employ novocain preceded by scopolamin and morphin as a routine, only using general anesthesia where some circumstance makes it advisable. The operative procedures are practically bloodless, especially where the ethmoid arteries are ligated, and this feature makes for more thorough work. Most extensive work may be done under local anesthetic without any pain whatever. To cite an extreme example of what can be done: I have recently removed a large osteoma from the frontal sinus and ethmoid regions under a local anesthetic, the operation requiring an incision from the outer end of one brow across to the end of the other. The choice of local anesthesia is more than a matter of opinion or convenience. It aids our technique and avoids dangers.

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F. H. BRANDT, M. D. (1052 West Sixth Street, Los Angeles)—Doctor Friesen's results are very satisfactory. In the majority of cases, however, we can manage very well by an intranasal procedure. I am referring to the operation by Halle, who has repeatedly shown that if we bear in mind the anatomy of the nose and operate accordingly we can secure satisfactory results.

Very often we have an extension of the ethmoid cells into and in front of the agger nasi, and by chiseling away the agger we can look right into the frontal sinus and can with ease curette any polypoid tissue that may be present, and thus have a large outlet for drainage.

In ethmoid operations it is well to bear in mind the location of the anterior cells, the presence of which often results in failure in ethmoid work. This frontal sinus operation is best done under local anesthesia.

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FRANK A. BURTON, M. D. (404 Watts Building, San Diego)—Doctor Friesen has presented his subject in a comprehensive manner.

It has been my experience that the most of my frontal sinus cases needing surgical interference respond satisfactorily to intranasal procedures. From time to time, however, I have a frontal condition which demands external surgery. In such a case I do the Lynch or some modification of the Killian operation.

Doctor Friesen recommends thorough knowledge of the anatomy involved. I believe it is wise to review carefully the anatomy concerned immediately preceding the operation. I agree with Doctor Friesen's conclusions as to the indication for the external frontal surgery. As to conservatism there are times when it is more conservative to do the external frontal than to attempt to correct the condition intranasally.

I also favor thorough use of the x-ray. I prefer a complete x-ray sinus study. In this way one often avoids overlooking additional sinus infection, as well as determining the size, shape and position of involved frontals. Whenever feasible I prefer to do the work under local anesthesia.

Doctor Friesen referred to the Killian operation. Some years ago I had the privilege of working in the clinics of Doctor Killian and am convinced that we owe much to his effort and skill for what we know of frontal sinus surgery. While at the clinic, I saw many of the results that Doctor Killian had obtained, and

he told me of a "change of heart" in his frontal sinus work—he was becoming less radical. I have never done an unmodified Killian, and never expect to do one, but I would not fail to give Doctor Killian much credit for his contribution to surgery of the frontal sinus.

Max Halle's extranasal frontal rather appeals to me. I have seen him do several, and have done one or two under his direction, and still use a modification of his technique in most of my chronic frontals. Free drainage and ventilation of the frontal sinus is the objective, but different surgeons have different successful ways of obtaining this objective.

Doctor Friesen is to be congratulated upon his judgment in the selection of the Lothrop technique in these three cases. Results are convincing. To my mind the last of the three especially emphasizes the type of case calling for the Lothrop operation.

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DOCTOR FRIESEN (closing)—I agree with Doctor Sewall that local anesthesia supplemented with scopolamin and morphin should be used whenever feasible. It is the anesthetic of choice in all nasal and sinus surgery because it facilitates better technique.

I wish to express my appreciation to the gentlemen who have so kindly discussed my paper.

SYPHILIS—ITS NON-SPECIFIC TREATMENT*

By MERLIN T.-R. MAYNARD, M. D.
San Jose

DISCUSSION *by Harry E. Alderson, M. D., San Francisco; Victor G. Vecki, M. D., San Francisco; Merrill W. Hollingsworth, M. D., Santa Ana.*

FEELING secure in the possession of arsphenamin, bismuth, and the newer associated antisyphilitics, it is unfortunate that we forget that this age-old disease was once successfully treated in many instances by largely non-specific methods. These non-specific methods, old and new, should be kept in mind when treatment with the so-called specific therapeutic agents seems to meet with failure. It may be that we should name the non-specific measures as "paraspecific," for they should be used along with the directly treponemicidal treatment.

SPECIFIC THERAPY NOT ALL-SUFFICIENT

I am speaking now in this sense with no idea of replacement of the specific bulwark of our armamentarium, but more to bring to the mind of the general practitioner of medicine that he should not be contented solely with specific therapy. Such a practitioner soon finds his first Wassermann-fast case and, after much treatment and a series of discouraging Wassermann reports, has no other method of attack and is finally deserted by a patient from whom faith in medical help has fled. I do not here speak of those patients who become permanently negative after one or two courses of the specifics, but of those hopeless, prolonged, recurrent cases, with or without cerebral or spinal involvement, who resist course after course of efficient therapy until both the patient and the doctor are equally discouraged. Too much contact with the course system of treatment blinds the physician to individualization, and too much individualization leads to the neglect of the specific "edge" of our therapy.

The treatment in the absence of definite contraindication must always be specific, but the individual's reactions are the non-specific problem. We also have little need of such aids in the primary and secondary stages of the disease, for the spirochetes are largely available through their intimate contact with the circulation. In these stages the massive infiltrations are not present, and it is only after the mobilization of the cellular elements with the co-existing reduction of the caliber of the blood vessels, that iodids and fever and other infiltration-lytic agents must be used in order that our poisons may reach the spirochetes.

TREATMENT IN RESISTANT CASES

In the well-established resistant patient we may first use the non-specific properties of the specifics. In the first place, change the method of attack. Give the arsphenamin intramuscularly, preferably in the form of sulpharsphenamin, this choice being made to take advantage of the resultant tissue irritation which induces a generalized leukocytosis. Bismuth can be given in the same site because of the better absorption due to the local hyperemia. We can have the patient use his mercury in the form of rubs, but should also have him employ a masseur to give massage to the whole body for a similar leukocyte and circulatory stimulation. In the rest period he should receive an adapted form of the following measures, which aim not at a poisoning of the spirochete in the tissues by lethal doses of arsenic, but toward the destruction, or the control of this invading organism by the natural defenses of the body. Such defenses are heat (called fever), the action of the phagocytes, and the antibodies of the tissue fluids.

Many of the older and a few of the present syphilologists would condemn the giving of any treatment of a specific nature before the Wassermann reaction had become positive, and in pre-Wassermann days, before the secondary symptoms had developed. They support this stand by the assertion that it is not until this time that the antibodies have developed and the natural defenses of the body are operating, and if specific therapy be given before this time the immune phenomena are prevented and the infection becomes more deeply seated in the organism.

FEBRILE REACTION TREATMENT

The other methods that can be used are the stimulation of a febrile reaction by the introduction into the body of a foreign protein, as originally suggested by Wagner von Jauregg, and in which tuberculin, typhoid vaccine, gonorrheal vaccine, or other febrile stimulants are injected to produce high temperatures in the body. The same author also suggested the inoculation of the patient with malaria, following which he be allowed to

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* From the Skin Clinic of Dr. H. E. Alderson, Stanford University Medical School, San Francisco.

* Read before the Dermatology and Syphilology Section, California Medical Association, at the Fifty-Sixth Annual Session, April 25-28, 1927.

have twelve or more chills before the disease is stopped with quinin. This method is now in general use with patients who have no contraindications, such being myocarditis or other severe organic disease, and sensitization to quinin. Fever can also be produced by the external application of heat, the best controlled method being the use of the prolonged hot bath.

Shamberg and Rule have recently demonstrated the possibilities of this method in experiments on rabbits. A definite strain of spirochete was subjected to heat on the water bath before inoculation into the rabbit's testicle. Infection did not take place even though the organisms were still motile. The organisms in question were kept at a temperature of 104 degrees for twenty minutes, and this repeated on a number of days. This temperature is, of course, often found in malaria. These same authors have other experiments in progress in which they are subjecting patients to hot baths to produce temperatures up to 102 degrees F. and suggest that it may be found that a hot bath can become a measure in prophylaxis as well as treatment. In rabbits, virulent strains failed to infect if a bath to produce a temperature rise of 104 F. in the animal was given three to four days after inoculation.

TONIC THERAPY

Leukocytes may be increased by the intramuscular injection of turpentine in oil, or the use of milk in a similar way. These injections should be given on the same day with salvarsan; or six to ten injections should be given in the rest period or immediately preceding specific therapy.

The use of rest, fresh air, good food, and the general practices of good hygiene are important. General tonics are advisable, the patient often doing well on a cod-liver oil mixture or a dietary stimulant such as the old elixir of iron, quinin and strychnin. The use of the cacodylates is subject to question and, if used at all, should be given intramuscularly. In such a method of administration one gains a leukocyte producing irritation and avoids the lytic action on the red blood cells that occurs in the intravenous method. A further advantage of this method is that the spirochete is not exposed to frequent non-lethal doses of arsenic, and the same danger of the production of arsenic-fast strains is not present.

IN CONCLUSION

In closing I would say that we should not forget that the patient has a resistance mechanism of his own to be considered, and we must take advantage of it if the patient is to receive full justice in the treatment of his syphilis. We see this commonly in our clinical work and at the Stanford University Medical School. We have learned that patients with bone lesions, recurrent eruptions, persistent chancres and other bugbears of the syphilologist who return over and over for specific therapy without appreciable change in their condition are those that demonstrate to us the need of adjuncts of a non-specific nature if we are to hope for appreciable improvement in them; and we believe that, although not all such patients respond favorably, the results obtained thoroughly justify the further use of paraspecific measures.

511 Twohy Building.

DISCUSSION

HARRY E. ALDERSON, M. D. (490 Post Street, San Francisco)—Doctor Maynard has discussed in an interesting manner a very important phase of the treatment of syphilis. All who have had much experience with this disease appreciate fully the importance of auxiliary non-specific treatment designed to improve the patient's resistance and aid in the production of antibodies. This auxiliary treatment includes the use of physiotherapy as well as various so-called tonic medicines. Too often only routine injections of the arsphenamin, bismuth and mercury are used and no attention paid to underlying unfavorable conditions delaying return to good health. The eradication of a streptococcus focus is apt to be followed by more definite results from the antisyphilitic therapy. We have seen so-called "Wassermann-fast" cases change very definitely for the better after surgical removal of foci of infection. Of course in such cases the question always arises whether or not the operation brought about conditions analogous to what follows protein "shock therapy." Nevertheless it is well worth while to bear this matter in mind in the treatment of persistent Wassermann cases. Naturally we always suspect the presence of some hidden spirochetal focus, but in spite of very careful cardiovascular and cerebrospinal investigations and other examinations, we have to make diagnoses of "latent" or "asymptomatic" syphilis only too often.

It is in these resistant cases that various "non-specific" remedies offer some hope of stimulating improvement. For years at the Stanford Skin and Syphilis Clinic we have been teaching our students that the treatment of syphilitics ***must be individualized.*** In the handling of these asymptomatic cases is this particularly true.

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VICTOR G. VECKI, M. D. (516 Sutter Street, San Francisco)—Any syphilologist of any experience will readily subscribe to every word of Doctor Maynard's timely and able paper.

It contains irrefutable truths that bear repetition and which can never be sufficiently emphasized.

In the last century Sigmund, Fournier and others repeatedly stated that, while a hygienic mode of living is good for everybody, it is imperative for anyone afflicted with syphilis. We are still unable to state with absolute security that any given case of syphilis is really cured, but we have in the Wassermann reaction and its modifications, mainly, however, in the Verne reaction, valuable aids in determining what should be done in every individual case of syphilis.

Physiotherapy in its various forms, the various foreign proteins, even Zittmann's decoction, may be of help, and it can never be emphasized enough that iodids must never be forgotten.

Obviously it must not be overlooked that a person afflicted with syphilis may also suffer from some other ailment.

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MERRILL W. HOLLINGSWORTH, M. D. (409 First National Bank Building, Santa Ana)—Doctor Maynard has opportunely brought to mind a very important but frequently neglected side of syphilotherapy. I have used daily hot baths on three patients, attaining a mouth temperature of 104 degrees F. in two patients and 106 degrees F. in one patient. The duration of the baths was twenty minutes, and they were continued for eleven days in each case. No helpful effect on the course of the disease was observed. Joseph

Schumacher of Berlin attributes the benefit derived from foreign protein injections not to the heat produced, but to the proliferation of lipoproteolytic enzymes; and he further states that a lipid-albumin mixture must be used as an antigen, since his experiments show that injection of a pure protein to be devoid of beneficial action.

Doctor Maynard mentions injecting proteins and the arsphenamins the same days. Many prefer to inject the proteins on days in between the arsphenamin injections. While at Vienna I was entirely won over to malaria therapy as there administered. They are using it as an experiment in all stages of syphilis, but the fever has not the lethal action on the spirochetes as suggested by Shamberg's work. Moist lesions still teem with spirochetes at the end of a course of twelve febrile paroxysms. Injections of bacterial proteins are followed by more severe reactions than animal proteins. I have used typhoid vaccine intravenously with good result.

THE LURE OF MEDICAL HISTORY

BOERHAAVE

By JEAN OLIVER, M.D.
San Francisco

TO them it was no temporary armistice—no breathing space between the heats of battle. Victory seemed complete and the way open to any heights that they, the supporters of the New Knowledge, might care to ascend. The old captains had indeed fallen—Paracelsus, Vesalius—but the inspiration of their leadership remained—to follow the courses which they had laid out could lead to only achievement.

Perhaps it was that the victory appeared too complete—nothing remained apparently of the Hippocratic-Galenical School but an historical memory, and as they stood on the threshold of the 17th century, it seemed that they at last had reached a resting place where they might count up, distribute and enjoy the fruits of their predecessors' efforts.

In this attitude they were not alone. They saw the vast "matériel" which the world had gained since the re-birth of knowledge worked and moulded into the edifice of Philosophy by Locke and Spinoza. How can we, wise only in the wisdom of their failure, judge them if they too wished to see Medicine a completed and organized member of the establishment of science? For man is a feeble creature, slow to learn, handicapped as he is over the rest of God's creatures by the fatal gift of reason, which can lead him from the straight and narrow way of experiment into the devious ways of ratiocination. The taste of the fleshpots of medieval dialectic still filled their mouths and they sighed again for the comforting logic of a summa—a unity of knowledge, complete in and of itself, all-embracing and final.

And so appeared Hermann Boerhaave. It would be difficult to imagine one more suited to the task. The son of an erudite minister, he received the customary training in the classics including theology. The decision to enter medicine rather than the ministry was as much the result of his acquirement of a reputation as a follower of the free-thinker Spinoza which barred the latter course to him than of actual choice. But once on the path

his progress was rapid, Professor of Medicine, then Rector of the University of Leyden, finally filling four chairs at once, those of Theoretical Medicine, Practical Medicine, Botany, and Chemistry. Pupils flocked from all Europe and even Asia to sit at his clinics. And here, to give proper credit, was an innovation which we owe largely to him. Leyden became the center of medicine, not only for those who would learn but also for those who would be healed. Dukes and princes waited for his consultations; even Peter the Great on his journey through Europe interrupted his itinerary to spend an evening with the Prince of Clinicians. For such he was as no one before or since has ever been.

His manner with patients must have been remarkable indeed. An English nobleman gave him a complete country estate for the advice that he take some exercise—not given of course in such words, but in a complicated description of the proper method of rowing that would be beneficial to this particular patient, elaborately interlarded with classical erudition and theory. His numerous letters to the ailing great ones that consulted him for their troubles are remarkably devoid of any positive advice in the line of treatment, but full of long-winded régimes that nevertheless seemed impressive to the times. They have been preserved for us, along with almost every casual remark of the Great Physician by Van Swieten, whose stenographic gatherings are such a marvel of completeness as would have made a Boswell jealous.

Not only was his local fame as a clinician tremendous, but also his renown as a scientist. His "orations," which are numerous, are filled with his desire to combine medicine with science. He is credited with the introduction of the thermometer into clinical use. He praises experimentation as the source of all knowledge and yet in all his career we have a record of only one use of the method. He observed that a dog and cat survived the heat of an oven in which he placed them longer than did a sparrow! But who would find time for grubbing in Nature's vitals when Kings waited to be healed, students to be inspired, "Orations" and "Institutes" to be written—all pursuits properly recompensed by honors, adulation and, not to be

despised, the fortune of two million guilders which he left to his daughter.

It is a strange trick that time in the ironic manner has played on this man's rôle in medical history. For his worshipers whose eulogies became almost incoherent in the volubility of their adulation, give in fact a very accurate valuation of his place in medicine. But how different a level from the peak to which they would have elevated their idol. The "Dutch Hippocrates"—they could conceive of no greater compliment. Yes, he was a reversion of almost two thousand years! Fortunately the germ that others had planted survived the drought of his arid eloquence. Medicine halted, but took the pace again, even with his own pupil, Haller.

And glance at the "Commentaries," compiled by the sedulous Van Swieten. Here, indeed, is a fitting monument to the Master—summing up as they do in eighteen volumes the amazing fact that there was not one single addition to human knowledge made by this semi-divine oracle.

The portrait is from his "Collected Works." The benignity of success and authority beams upon us.

Stanford Univ. Medical School.

CLINICAL NOTES, CASE REPORTS AND NEW INSTRUMENTS

MYELOMA*

By KENNETH S. DAVIS, M. D.
Los Angeles

MYELOMA is a specific malignant tumor of the bone marrow, characterized chiefly by multiple foci of origin, a uniform and specific structure composed of plasma cells or their derivatives, Bence-Jones protinuria and a fatal termination. This is the orthodox description of the disease given by most pathologists, but it is subject to extensive modifications, as will be seen in the presentation of one of my cases.

In typical cases of multiple myeloma the x-ray findings are suggestive but not positive. The flat bones are more commonly affected, the skull, ribs, and pelvis, being the sites of predilection. However, in cases with extensive involvement practically all the bones in the body may show changes. The lesions are multiple, the bones showing numerous, fairly sharply circumscribed areas of destruction of varying size, but small as a rule. In the skull especially the findings are spectacular, for here we see numerous punched-out areas scattered through out the calvarium. Unfortunately certain types of carcinoma (hypernephroma, etc.), can give relatively the same findings.

Fig. 1—Case 1. The anteroposterior roentgenogram of the left shoulder showing multiple areas of fairly sharply circumscribed bone destruction and a pathological fracture of the shaft of the humerus.

Bence-Jones proteinuria is a valuable aid in the differentiation of myeloma, but even this test is not infallible, as Webster and others state that Bence-Jones bodies have been noted in sarcoma and metastasis to bone. Pathological fractures are common, occasionally being the reason for the discovery of the malignancy. There is rarely any expansion of the bone cortex or invasion of surrounding soft tissues. The symptomatology and pathology of this affection are so well known that their discussion here has been purposely eliminated.

Fig. 2—Case 1. The lateral roentgenogram of the skull showing multiple, circular-shaped, sharply circumscribed areas of bone absorption. These areas vary in size, but tend to be small.

CASE REPORTS

CASE 1—A woman 51 years of age was admitted to the hospital on January 20, 1927, complaining of a painful left shoulder. Three months prior to admission she had wrenched her left arm, and the left shoulder had pained her since that time. She also complained of pain in the lumbar spine, especially when bending or getting up and down. This "backache" was of ten years' duration, but had only been severe the past seven months.

There was a moderate weight loss (about twenty pounds) due partially to restricted diet. No other symptoms. Physical examination was essentially negative.

The roentgenogram of the left shoulder showed multiple small areas of bone absorption in the head and shaft of the humerus with a pathological fracture in the shaft about six inches below upper articular surface. Similar areas of bone absorption were noted in the clavicle, scapula and ribs included in the roentgenogram. (See Fig. 1.) Because of these findings, roentgenograms of other bones were made, similar changes being noted in the pelvis, ribs, femurs, and skull. (See Fig. 2.) Roentgenograms of the lumbar spine showed an absorption of the transverse process

* From the X-ray Laboratory, St. Vincent's Hospital, Los Angeles.

of the third lumbar, left side, and a marked decalcification of the body of the fourth lumbar which was somewhat flattened when compared with the other vertebrae. There was a strongly positive Bence-Jones proteinuria; this, together with our suggestive x-ray findings, led us to make a diagnosis of multiple myeloma.

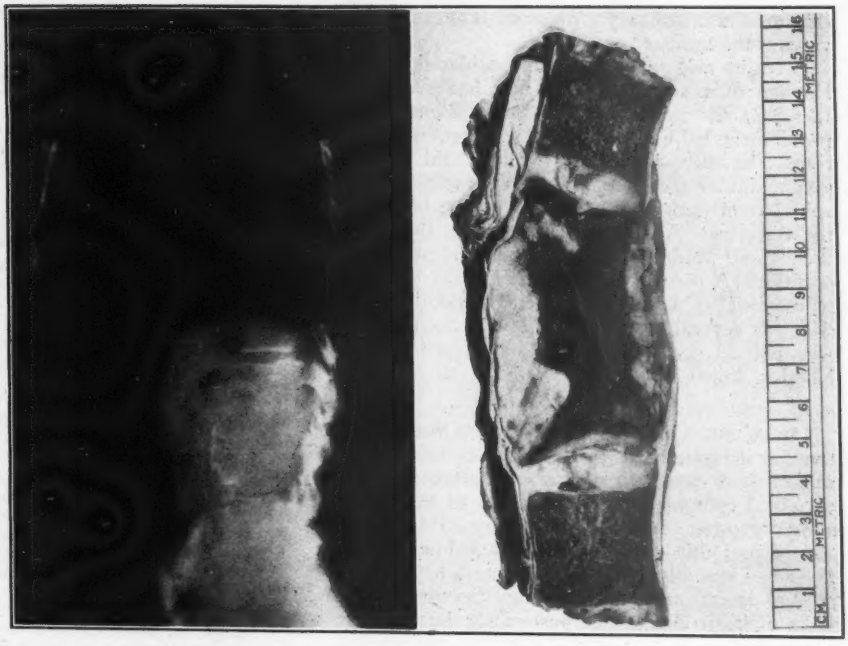

Fig. 3—Case 2. The lateral roentgenogram of the lumbar spine. Shows the absorption of the bone substance without marked flattening of the bodies or destruction of the intervertebral cartilage. Compare with Fig. 4.

Fig. 4—Case 2. Photograph of the vertical section through the lumbar spine at the site of involvement. Compare with Fig. 3.

The patient died April 3, 1927, less than three months after her roentgen examination had been made. The ten-year history of pain in the back probably had no bearing on present illness, although there are cases of myeloma on record in which the patient has lived three or more years. The beginning of the lesion more probably dates back to the onset of the severe stabbing pains in her back when bending or attempting to get out of a chair. When she was seen by us her general health was good and she was able to attend to her duties as a housewife. The pathological fracture probably accounts for the painful shoulder and, incidentally, was the means by which the malignant bone condition was discovered. No autopsy was done as patient lived out of the city.

Case 2—Patient, a male, 62 years of age, was referred to the x-ray laboratory for roentgenograms of the lumbar spine, December 1, 1926. He complained of pain in the lower part of the back, more marked on the right side. The pain was dull, continuous and aggravated by any movement. Patient's sleep was disturbed by muscular cramps of marked severity. He was unable to sit or stand in an upright position for any length of time, as this increased the severity of the pain. There were no other symptoms, and his general health was fairly good. Up to the time of onset of symptoms patient had always been very active for a man of his age, playing tournament tennis as well as golf.

ROENTGENOGRAPHIC FINDINGS

The lateral view of the lumbar spine showed an absorption of the lower half of the body of the first and an almost complete disappearance of the body of the second lumbar. The body of the third was moderately flattened and almost decalcified except for a thin shell of bone around the periphery. So far as could be determined, the intervertebral spaces were intact where visible and the bodies of the vertebrae, while destroyed, were not markedly flattened. (See Fig. 3.) In the anteroposterior view there was noted a bilateral soft tissue shadow extending along the sides of the vertebrae in the region of the involvement. This shadow was not dense enough to suggest abscess. There was an absorption of the transverse process of the second lumbar, right side, and a practical disappearance of the bodies of the first, second and third vertebrae, corresponding to the findings noted in the lateral view. Roentgenograms of other bones were negative for demonstrable pathology.

DISCUSSION OF THE ROENTGENOGRAPHIC FINDINGS

Clinically the case had been diagnosed as tuberculosis of the spine. However, the intact intervertebral space and the fact that the bony substance of the bodies of the vertebrae had been absorbed without marked flattening led me to make a diagnosis of bone tumor rather than inflammatory lesion.

Osteoclastic metastases as a general rule produce a mottled rarefaction of the bone which is quite characteristic. Multiple vertebrae are involved and other parts of the skeleton show similar irregular areas of bone absorption. If the process is extensive in a vertebra I have usually found that there is a more marked compression of the body than was observed in this case. The fact that more than one vertebra was involved was against a benign tumor so that the final x-ray

diagnosis was primary malignant bone tumor involving the lumbar vertebrae.

Sarcoma and myeloma were considered, but the absence of involvement of other bones and the fact that the urine failed to show Bence-Jones proteinuria, led us to give sarcoma first consideration. The only other lesion which could possibly give a similar roentgenographic appearance was a spinal cord tumor with erosion of the bodies of the vertebrae. As a rule in these cases the dorsal arches and laminae show the most extensive absorption. A course of x-ray treatments was recommended to which the patient responded very well for several weeks. Pain still continued, but was not so severe. He then developed a cord bladder, failed rapidly and died March 23, 1927.

AUTOPSY FINDINGS

Lungs, heart and abdominal viscera were negative for demonstrable gross lesion. In the lumbar region there was a fusiform enlargement of the vertebral column. This was found to be due to a new growth involving the bodies of the first, second and third lumbar vertebrae. The growth projected laterally about 2 centimeters beyond the normal limits of bone, pushing the muscles in front of it. It also bulged posteriorly, but had not penetrated the spinal canal. Longitudinal section of the vertebrae showed a rather soft red center and a gray firmer periphery. The intervertebral discs were of normal thickness. (See Fig. 4.)

No involvement of any other bones was found. On microscopic examination the tumor was made up of polyhedral plasma cells, the final diagnosis being myeloma of the lumbar vertebrae.

SUMMARY

Both cases had an involvement of the lumbar spine; in the first there was a typical generalized involvement of the flat bones, vertebrae, and the left humerus. In the second the lesion was apparently limited to three of the lumbar vertebrae. These cases illustrate the wide variance that can occur in lesions of a similar histological structure. Myeloma with only a single lesion is not commonly encountered.

St. Vincent's Hospital.

STREPTOTHRIX MENINGITIS

CASE REPORT

By BERT S. THOMAS, M. D.
Sacramento

MY reason for reporting this case is twofold: first, because of rarity, and second, because the offending organism, which eventually proved to be a *Streptothrix*, may cause others the same anxiety that it caused me before its identity could be established.

At 4:30 a. m. on September 8, 1927, I was called to see T. S., a ten months old Japanese baby. The history was that of a "cross" baby on September 7, a rise in temperature during the evening, a slight convulsion at midnight, followed by a severe shake at 4 a. m. My examination revealed a well-nourished male baby, who was still spastic, and whose appearance indicated that any external disturbance would throw him into another convulsion. Rectal temperature was 105.6. Beside slightly exaggerated reflexes (with no inequalities), the only positive finding was the bulged and reddened gums over the two upper central incisors and the recent breaking through of the two lower central incisors.

The baby was sent into the Mater Misericordiae Hospital where another short convulsion occurred, followed by the vomiting of some clear green-tinged fluid. After a colonic flushing, ice cap, tepid sponges, chloral by bowel and phenacetin by mouth, the baby became playful and apparently normal by 10 a. m. The rectal temperature was then 99.4. The white blood count was 39,300 with 80 per cent polymorphonuclears. This, with a rise in the rectal temperature to 103 by noon, made me do a spinal puncture. This yielded a cloudy white fluid under markedly increased pressure. The cell count was 3840 per cu. mm. with 89 per cent of polymorphonuclears. A Gram stain on the fluid showed many ***Gram-negative*** bacilli. These organisms were not constant as to size. Some were small enough to resemble ***Bacilli influenzae*** while others were almost as large as the Hay bacillus. The fluid was planted on all media at the command of the hospital laboratory. This included lactose-agar, meat-infusion-broth, blood agar, bile, Loeffler's serum, Hiss' serum medium, lactose broth, maltose broth, dextrose broth, inulin—plus anaërobic control. Twenty-four hours showed no growth.

Adding to the other therapeutic measures, hexamethylenamin was given, fluids were administered by hypodermoclysis, and repeated punctures were done. A gradual down-hill course terminated in the death of the baby on the ninth day.

The leukocyte count of the fluid varied from 790 to 4370 per cu. mm., and the polymorphonuclears from 79 to 98 per cent. All fluid withdrawn was carefully studied. Repeatedly, and in great numbers, these ***Gram-negative*** bacilli were present, always varying from the short and small to the large and long forms. On the sixth day a sparse, cloudy culture appeared on blood agar; these stained and appeared (long and short) as those in the original fluid. At this time an appearance of slight branching forms in the original fluid suggested the question of a streptothrix, but the constant sure Gram-negative stain let this stand only as a possibility.

Finally, on the eighth day of the disease a five-day culture in a flask containing a generous amount of dextrose-meat infusion broth from the hospital laboratory showed long branching forms, some Gram-negative, and some Gram-positive. In several days, subcultures showed the typical Gram-positive streptothrix.

There are several questions for thought and consideration in connection with this patient:

First: The origin of the meningitis. Careful smears from the oral and nasal cavities gave no clew, though the probable entrance was through the cribriform plate of the ethmoid.

Second: The explanation of the morphology and staining qualities of the organism as seen in the withdrawn fluid. This probably may only be explained by its growth outside of its usual habitat.

Third: There remains the question of the possible therapeutic value of iodids if the organism had been identified earlier.

1027 Tenth Street.

The American Legion Believes in Home Care—Of the 523 children in care of the child-welfare division of the American Legion at the end of October, 391 were in the mothers' homes, 39 with relatives, 45 in foster homes, and only 48 in legion billets, local institutions, or hospitals. During October the per capita cost of providing for children in their own homes was $10.75; in local institutions, $24.48; and in legion billets, $70.—United States Department of Labor.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

THE TREATMENT OF COMPOUND FRACTURES

Leo Eloesser, San Francisco—It is surprising and disheartening to see how little we have learned from the lessons of the war. Of the few valuable facts that were gleaned from this great epidemic of injuries the immediate and aggressive treatment of contaminated wounds by debridement is the most valuable. Each of the combating powers learned by bitter experience the loss of life and limb that resulted from a "Let nature take its course" method of treating dirt-laden wounds and the incalculable saving that followed introduction of primary early debridements. This lesson, however, does not seem to have percolated into civil practice. Most compound fractures, in spite of frequent warnings, seem to be treated with compresses and the insufficient method of "allowing the swelling to subside," in other words, of standing by and watching the contamination develop into ineradicable osteomyelitis and other severe local and systemic infections.

The fate of a compound fracture depends utterly upon the first man who treats it; compound fractures call for immediate skilled attention—they are emergencies par excellence. The wound should be covered with a small bit of sterile gauze and the aseptic seal, the blood-clot that has been poured out over it allowed to remain. The first blood-clot is the only aseptic dressing ever applied to a wound; all later ones are contaminated by bacteria. With the small gauze sponge held firmly over the wound the limb should be shaved away from the wound edges with a dry razor. The skin should be cleansed with lime and soda paste and this washed off with a sponge moistened, not dripping, first with water and then with alcohol. When all the rest of the limb is thoroughly cleaned a tourniquet should be applied, the wound should be exposed and the edges, as well as all macroscopically dirty tissues, cut away with a sharp knife. The instruments should be changed frequently.

The ease with which fractures are reduced in the first few hours after injury is astonishing. If the bone is broken obliquely and the ends slip, they should be wired together or held by some internal fixation apparatus; the wound should be left wide open and irrigated with Dakin's solution every hour. If a debridement is apparently successful in leaving a clean wound one or two sutures may be passed through it and tied loosely; if the cleanliness is doubtful it is best to leave the wound wide open.

There is one class of compound fractures which are usually clean and do not need debridement—those which are compounded from the inside out, *i. e.*, when the aseptic bone pierces the skin; no foreign bodies are ground into the laceration.

After reduction has been accomplished the limb should be immovably fixed in an apparatus that will allow of easy inspection, a Thomas splint with traction or a plaster of Paris splint moulded directly without padding to one or two sides of the limb, leaving part of its circumference free.

If debridement is done promptly and skillfully and the fracture reduced immediately, much prolonged disability, stiffness of joints and future intractable suppuration will be avoided.

* * *

Edmund Butler, San Francisco—During my four years as a surgeon and eight years as chief surgeon of the San Francisco Emergency hospitals, a great number of compound fractures have come under my supervision and I have formed some very definite views upon the subject of treatment.

A simple classification of compound fractures is necessary for a logical discussion of treatment, and inasmuch as treatment of all long bones is fundamentally similar I shall select compound fractures of the bones of the leg:

1. Compound fracture with only a small perforation of the skin, no bone protruding at the time fracture is inspected.
2. Bone protruding through wound in skin.
3. Large wound in skin, extensive injury to soft parts, single fracture.
4. Large wound of skin, extensive injury to soft parts and comminuted fracture.

If the perforation of the skin is small and the fragment is not protruding the treatment carried out should be the same as in a closed fracture. Small glycerin and alcohol (equal parts) compress should be applied to the wound and changed daily. Prophylactic dose of tetanus-antitoxin, 1500 units, should be given, which is to be repeated if there is any evidence of infection. Soft parts should be carefully inspected and palpated daily for evidence of infection, particularly infection of the gas-forming organisms. If spreading infection is evidenced the wound is to be enlarged and free drainage instituted.

If the fragment protrudes through the skin and it is possible to remove all visible contamination, then thoroughly scrub protruding bone with tincture of iodin or 3 per cent mercurochrome solution and reduce without drainage. If unable to remove all visible contamination, it is best to enlarge the wound and to drain freely. Carrel-Dakin treatment of such a wound is ideal, and to date is the best treatment we have available.

The type splint used may be plaster, wire mesh, Thomas type, or any of the many patented cardboards or felt and glue types.

The desire in the application of plaster is to leave a large window so the wound and soft parts may be inspected frequently. The combination of the Thomas splint and the Carrel-Dakin treatment go together perfectly, but it is my advice that the doctor use the splint with which he is familiar and with which he can make the patient most comfortable. A splint that maintains apposition and the alignment of fragments, is comfortable to the patient, and permits of the inspection of the wound, is required.

When the skin and the soft parts are badly torn and infection of the wound is evident, such fracture should be treated with the Thomas splint and the entire wound flooded every two hours with Dakin solution. If the bone is exposed for a considerable distance, and the fracture is oblique, I frequently put a large bone plate on the most accessible portion of the bone and use Carrel-Dakin treatment. An extensive wound may require at least one dozen tubes. Small catheters make admirable Dakin tubes.

With large wounds and comminuted fractures it is imperative to use Dakin solution, because it is impossible to eliminate infection in soft parts, whose blood supply has been restricted. Injury and infection may mean a useless leg. If the wound is properly Dakinized I have never seen infection spread. Therefore it is imperative that all surgeons handling this type of fracture familiarize themselves with the Carrel-Dakin treatment of wounds and the use of the Thomas splint.

If the fracture is transverse only slight extension may be necessary. This extension may be made with Steinman pin through the os calcis or above the os calcis. If the fracture is oblique then sufficient extension must be maintained to keep the fracture properly reduced. If the Lane plate has been used then no traction is necessary; although I feel that a little extension makes the patient more comfortable even when it is not necessary to maintain reduction.

* * *

Fred J. Davis, Westwood—For practical purposes we classify compound fractures under two headings: (1) Those caused by the end, or ends, of the fractured bone protruding through the skin from within. (2) Those caused by some object from without penetrating the skin, soft tissues, and finally fracturing the bone.

Those fractures under the first heading are of course potentially infected, as the end of the bone must touch the contaminated skin and clothing; but practically whatever infection there may be usually takes care of itself if given a chance. Such fractures should be molested as little as possible, a simple dry dressing (sterile) placed over the wound, the fragments adjusted as accurately as possible with little manipulation, the member splinted, or put in fracture box, and continuous traction applied, dressing changed as required, and the patient kept quiet. Usually in a week or so the wound will be healed and the fracture may then be treated as a simple fracture, the fragments adjusted under an anesthetic if necessary, and the member put in a cast. The most important thing in the treatment of these fractures is the gentleness in the first handling that the already damaged tissues be not further damaged, thus giving them the best opportunity to care for any slight infection which might have been carried into the deep tissues. Probing and swabbing should be strictly avoided.

Occasionally these fractures do become infected; if so, free incision and drainage is the proper course to pursue, still maintaining traction and keeping the fragments in the best possible position. Further treatment of these infections of course depends upon the severity and type of infection, and will not be discussed here.

Compound fractures coming under our second heading, those compounded from without, call for more radical treatment. These should be widely opened, all foreign matter and damaged tissue removed, thoroughly irrigated with Dakin's, or other similar antiseptic, the wound left open for drainage and suitable dressings, and traction applied.

If no infection occurs, the wound heals rapidly and a good limb results. If infection develops, good drainage must be provided until the wound eventually heals, or until there are indications for further operation, such as the removal of dead bone, etc.

* * *

Charles C. Falk, Eureka—No matter where the fracture is located, the important points that have served me well are:

First: Cleansing thoroughly every involved part; for this a one-half per cent fairly hot liquor cresolis compound solution will remove fairly well grease and foreign materials; is non-irritating and a good antiseptic.

Second: Removing all destroyed tissue, eliminating necrosis.

Third: Establishing thorough drainage, preventing opportunity for formation of pockets. If destruction is great, rubber tubing is used; otherwise, twisted catgut or silkworm gut. It is not necessary to leave any of these drainage materials longer than ninety-six hours.

Fourth: Dressing. My experience with Dakin's solution has not been entirely satisfactory, due to difficulty in obtaining perfectly fresh, properly neutralized solution. If not fresh and properly neutralized, the antiseptic element is questionable, and the solution is often very irritating. Ochsner's solution, composed of one part 5 per cent carbolic acid, one part 95 per cent alcohol, and six parts saturated boric acid, has been used for the past fifteen years, saturating dressings sufficiently large to take up all drainage, then covering all parts of dressing with light rubber sheeting; this retains heat of affected parts, relieves pain and keeps dressings absolutely moist and hot. Never at any time has this dressing caused irritation or toxic absorption, and of all dressings has served me best. These dressings are changed first at the end

of seventy-two hours, then every twenty-four or forty-eight hours, according to drainage.

Fifth: Fixation, using any of many satisfactory types. Personally, in arm or leg fractures I prefer an ordinary pillow, which not only acts as a fixation splint, but is exceedingly comfortable. The pillow is tied around the dressings with ordinary bandage material, using from four to six parts; the more used the more efficient the splint.

Sixth: Extension, sufficient to prevent muscular contraction and bony overlapping. In ordinary cases extension longer than fourteen days is unnecessary; by that time tissues have adjusted themselves to conditions.

Remarks: Continue moist dressings as long as there is drainage; fixation as long as there is abnormal mobility. When wound has healed, a light plaster of Paris cast is applied and use of parts insisted upon. If there is bony overlapping, and it is certain that bony union will not be re-established, plating is preferred to bone sliding or transplanting. The success of plating lies entirely in the prevention of mutilation of the soft parts and in overhandling of bony structures. Make as large a cut as necessary straight down on top of bone through periosteum, then free the periosteum from bony structures without touching soft parts; then with proper bone instruments perfect apposition and fixation should be obtained. Close soft parts with through and through silkworm gut sutures, being careful not to tie stitches too tightly. Buried sutures have not been found satisfactory. Following above methods it has been found necessary to remove very few plates. In delayed union a light cast and rather free use of parts gives excellent results.

Local Patients Kept Out of Hospitals by Motoring Victims—The number of motor accidents has become so great as to constitute a special problem for hospitals. Mr. J. C. Buchanan, secretary of the British Hospitals Association, said in the press that the question of the effect of the growth of motoring on the finances of hospitals has been engaging the attention of the British Hospitals Association for the last few months. "Hospitals throughout the country are overcrowded with injured patients from other parts. In many cases patients are unable to secure beds in the hospitals which their district supports because they are full up with people from other places. We are considering the question of securing an amendment of the law to enable voluntary hospitals to include, in their expenses, statements of claims arising from motoring accidents."

Nomenclature of Drugs—A correspondent has sent us the following complaint. He read in an American article a strong recommendation of a drug called methenamin as a urinary antiseptic. Inquiries made by the dispensers of his hospital failed, however, at first to identify any drug of this name, and it was only after some trouble that our correspondent learned from America that methenamin was the title adopted by the tenth edition of the United States Pharmacopeia for hexamin. This is a very typical example of the confusion that is bound to arise if more than one official name exists in the same language for a single drug. We know that similar confusion is constantly arising in regard to many other common drugs which have different titles in this country and in the United States. In this particular instance the actual history of the nomenclature of the drug is as follows. The substance hexamethylen tetramin became known to the medical profession under the proprietary title of urotropin. It was included in the British Pharmacopeia, 1914, under the title hexamin, and in the United States Pharmacopeia IX, 1916, with the name hexamethylenamin. Although these titles were not identical, yet they were sufficiently alike to prevent confusion, but unfortunately in 1926 the name was changed to methenamin in the United States Pharmacopeia X. We understand that this change was made because it was felt to be desirable to shorten the name, and unfortunately proprietary rights were claimed in the United States of America over the name hexamin. Some similar reason will usually be found in most cases where a variegated official nomenclature for a single drug puzzles and annoys the practitioners of medicine. Such histories obviously indicate a very unsatisfactory state of affairs. Medical literature is international, and this is true in a special sense of all medical literature written in the same language. There is every advantage in having only one official name in the English language for any particular drug. One difficulty is that a large proportion of new drugs are introduced as proprietary articles, and it will usually be necessary for the medical profession to endure one change of name when such drugs are first introduced into the pharmacopeia. There is, however, no reason why more than one such change should be inflicted, and it is to be hoped that some international agreement will be obtained to insure that, when a name has once been introduced as an official pharmacopeial name in either the United States or this country, it shall be free from capture as a proprietary name, and shall be adopted as the official name in both countries. The value to the medical profession of official names for drugs that have been introduced under proprietary titles is that an official and nonproprietary name often reduces the price of a drug by throwing its manufacture open to competition, but if the official names do not succeed in establishing themselves in common use they fail to serve this purpose. Now the task of obtaining a satisfactory official name for any drug that has been established under a proprietary title is always likely to be difficult, because the most suitable and obvious names are just the ones which are most likely to be subject to proprietary right. Moreover, the proprietary name usually has a long start of the official name. If in addition to these unavoidable handicaps the official names differ in different countries, it must often happen that the official names will be ignored and the proprietary names retained in use.—Editorial in *Brit. M. J.* 2:1153, December 17, 1927.

Abnormal Prevalence of Meningitis in 1927—The United States Public Health Service reports that there was an abnormal prevalence of spinal meningitis for the year 1927 as compared with the preceding two years. Thirty-seven states and the District of Columbia, having an estimated population of more than 90,000,000, reported 2317 cases of meningococcus meningitis for the forty-nine weeks from January 2, 1927, to December 10, 1927; 1571 cases for the corresponding period of 1926, and 1226 cases for the forty-nine weeks in 1925.—*The Boston Medical and Surgical Journal.*

Coffee Is Regarded as Beneficial—Professor Ralph H. Cheney of the biology department of the New York University is quoted as saying that "Evidence derived from my study of the effect of coffee on animals and man indicates that the properly prepared beverage is highly advantageous with respect to over 90 per cent of normal individuals. . . . Caffein is a drug and its use can be abused, but acute injury, as far as the caffein content is concerned, would necessitate the consumption of over 150 cups, which is, of course, ridiculous." There must be recognized idiosyncrasies in the use of any article of diet.—*The Boston Medical and Surgical Journal.*

California and Western Medicine

Owned and Published by the

CALIFORNIA MEDICAL ASSOCIATION

Official Organ of the California, Utah and Nevada Medical Associations

BALBOA BUILDING, 593 MARKET STREET, SAN FRANCISCO

Telephone Douglas 62

Editors . . . . . GEORGE H. KRESS, EMMA W. POPE

Associate Editor for Nevada . . . HORACE J. BROWN

Associate Editor for Utah . . . . . J. U. GIESY

Subscription prices, $5.00 ($6.00 for foreign countries); single copies, 50 cents.

Volumes begin with the first of January and the first of July. Subscriptions may commence at any time.

Change of Address—Request for change of address should give both the old and the new address. No change in any address on the mailing list will be made until such change is requested by county secretaries or by the member concerned.

Advertisements—The journal is published on the seventh of the month. Advertising copy must be received not later than the 15th of the month preceding issue. Advertising rates will be sent on request.

Responsibility for Statements and Conclusions in Original Articles—Authors are responsible for all statements, conclusions and methods of presenting their subjects. These may or may not be in harmony with the views of the editorial staff. It is aimed to permit authors to have as wide latitude as the general policy of the journal and the demands on its space may permit. The right to reduce or reject any article is always reserved.

Contributions—Exclusive Publication—Articles are accepted for publication on condition that they are contributed solely to this journal. California and Western Medicine has prepared a leaflet explaining its rules regarding publication. This leaflet gives suggestions on the preparation of manuscripts and of illustrations. It is suggested that contributors to this journal write to its office requesting a copy of this leaflet.

EDITORIALS

THE CALIFORNIA BOARD OF MEDICAL EXAMINERS—WILL IT CEASE TO EXIST AFTER THE NEXT SESSION OF THE LEGISLATURE?

The next session of the California legislature will convene in January, 1929, which is less than twelve months distant. The election for state officers and legislators will be held in the Fall of this year 1928.

The fifty-seventh annual session of our state medical association, the California Medical Association, will convene in April, 1928, only two months away.

The above sequence of calendar events is summarized so that members of the California Medical Association may better visualize for themselves the time elements involved if certain important public health and medical legislative problems are to be properly considered.

For it is desirable that we should take up in ample time and in deliberative manner the consideration of those public health and medical measures which we may wish to espouse when later on our civic elections are held and our lawmakers meet; and to fully understand what we must do to accomplish the ends which at this time we may have in mind, and at what rate we must carry through our work.

* * *

It is not the purpose here to discuss the many public health matters which might be given consideration prior to the annual meeting of the California Medical Association, for most of such subjects would require more space than at this time could be allotted.

It is our present object, however, to call attention to one very important matter, concerning which the component county medical societies and their respective members may well give some thought and discussion, since it has to do in California with a proposed radical change in the method of licensure of graduates of schools of medicine, who in the future may desire to acquire the legal right to practice their profession in this state.

* * *

By this proposed somewhat radical change in our state medical law the present California Board of Medical Examiners, as we have it and have known it for the last twenty-five years or so, would cease to exist!

Its place would be assumed, or it might be more correct to say, its functions would be taken over by a proposed new department of the state government which would go under some such name as the Professional Standards Department of California, its director or chief having a place in the so-called Governor's cabinet.

Those members who do not understand this cabinet plan can acquaint themselves in regard thereto by perusing the editorial in the October, 1927 issue of this journal, page 528; wherein the changes already made and still to come are outlined.

* * *

This proposed new Professional Standards Department of California would take over the functions of some sixteen or so licensing boards now existing in the state, the work of licensure being carried out under the supervision of a chief, probably a layman, who through paid deputies would decide what would be proper questions to ask of those seeking licenses to practice their special businesses, arts or professions, among such applicant groups being the plumbers, the barbers, the engineers, the beauty specialists, the physicians and surgeons, and others. These paid deputies who would examine applicants for physicians' and surgeons' certificates would also decide on such matters as the evidences of preliminary and professional education which might be submitted, the value of the answers given in the written and oral examination tests, and so on. In fact everything now done by the present board of examiners, even including the first steps in the prosecution of illegal practitioners.

This vista as just briefly described, which the members of the California Medical Association and the component county societies of that organization are now called on to consider, must be acknowledged to be little less than startling!

* * *

In Illinois this plan was inaugurated some years ago, and the work of medical licensure in that state for several years was of such standard that the present California Board of Medical Exami-

ners, in common with other states in the Union, refuses to recognize any reciprocity with Illinois for certain of the years in question because of the low standards then obtaining. That is how the plan worked out in the great state of Illinois!

A side thought thereto is this: Would a future lay chief of the proposed California Professional Standards Department decide the above present board ruling to have been arbitrary or unjust? If so, then California would witness the influx of a goodly number of physicians who were licensed during the low standard régime years of Illinois, and no doubt a goodly number of these reciprocity applicants, after licensure here, would seek admission into the component county medical societies of the California Medical Association! Who could and who would say them, nay?

* * *

As stated in the CALIFORNIA AND WESTERN MEDICINE editorial previously referred to, the plan of consolidation of the multitudinous bureaus and administrative agencies which existed in California in the past had and has much to commend it.

But the writer must submit his own opinion that the plan to include our California Board of Medical Examiners in such a Professional Standards Department may result in serious detriment to the public health and medical interests of the people of this state. And those interests are so vital a part of the rights of citizens that they should be paramount to economic reforms, which might be very applicable or desirable for boards of less grave or arduous responsibilities.

* * *

We have only to look back at the last two or three decades and to consider the many delicate and serious medico-legal problems that have come before the present California Board of Medical Examiners and its predecessors, to be convinced that such difficulties would probably be multiplied and magnified under a direction less altruistic and less skilled than that given by present and former colleagues on the examining boards; who in the name of the medical profession have performed so efficiently and so generously these very important public health services for the people of California.

* * *

Also, it is worth remembering that when the California Board of Medical Examiners would cease to exist as such, the Osteopathic and Chiropractic Boards, which came into existence several years ago through initiative vote of the people of California, would continue to function, with no loss of rights to the Professional Standards Department which the next legislature in all probability will be asked to bring into existence. In other words, those comparatively recent groups of practitioners are seemingly in a more independent and advantageous position than is our own group in the premises which will face us when the 1929 legislature convenes in January next. That is, unless we inaugurate measures to prevent such proposed action being taken.

* * *

The alternative procedures which the licensed physicians and surgeons of California and, more particularly, which the California Medical Association and its component county societies must consider may be said to be two:

First: To acquiesce in the elimination of the present Board of Medical Examiners, now composed of ten physicians and surgeons receiving pay so nominal that their services are practically a donation to the state, the place of such board being taken by a probable lay chief of a newly created Professional Standards Department and his salaried deputies; and

Second: The consideration of the desirability of having the California Medical Association sponsor an initiative which would keep the present board of medical examiners in existence; and which action would be requesting no greater rights from the citizens of California than those which they have already granted to osteopathic and chiropractic practitioners.

In this connection the question of also sponsoring an initiative for a Basic Science Board, such as was discussed on page 525 of the October, 1927 issue of this journal, would also come up for consideration.

* * *

We medical men and women certainly have the right to fight vigorously for all those measures which will maintain to the highest possible average the educational and professional standards of our own group of practitioners, in order that we may the better serve the public health interests of California, as well as those sick and injured citizens of the commonwealth who seek our professional care and aid. It is therefore proper that this proposed legislation be called to the attention of the more than 4400 members of the California Medical Association. A special committee has already made a report on the subject to the Council of the California Medical Association and the same may be printed in due time.

* * *

These preliminary comments are submitted in this issue so that members of component county societies, and especially the delegates and alternates thereof, may bring the matter to the attention of the officers and program committees of their respective county societies, in order that the questions at issue may be brought up and discussed in the March or April meetings of their local organizations.

If that is done the delegates who will represent the county societies at the next annual session of our association at Sacramento will be in position to act with decision on this important matter, which so vitally affects the interests not only of the medical profession, but of the lay citizens of California.

All members of county societies who believe this problem to be one of gravity are urged to take

steps to have an adequate discussion thereon take place at an early day in their respective county societies. The county society which fails to bring this matter to the attention of its members may be said to have failed somewhat as regards its obligations to organized medicine. The solution of the problem will be before the citizens of this state this Fall or the coming Spring, and the House of Delegates of the California Medical Association at the Sacramento meeting must determine what course of action shall be followed.

* * *

If we decide on an initiative and are successful in regard thereto our licensure troubles with the California legislature of 1929 and its successors will have come to an end. If, however, we procrastinate or vacillate, then when the next legislative session convenes in January, 1929, we will have a serious proposition to consider; and in all probability our colleagues who will secure licenses in the future will also ponder as to why we permitted certain things to come to pass. And if physicians and surgeons of poor training and qualifications are admitted through such a new board, even those of us who practice in California today may have reasons to reproach ourselves in the days to come; for reasons more than one.

SOME HISTORICAL FACTS CONCERNING THE CALIFORNIA MEDICAL ASSOCIATION—THE COMMITTEE ON HISTORY OF THE C. M. A.

The annual directory of members of the California Medical Association, which was recently sent to each of its more than 4400 members, contained a brief historical account of the Association.

One paragraph in that sketch should be of more than passing interest to us, since it vividly portrays the marvelous growth of California in the last half-century; and indicates how the manifold agricultural, manufacturing, economic and cultural developments of this empire domain on the shores of the Pacific, associated with the wonderful changes in transportation facilities, have been responsible for great changes in the geographical makeup of the California Medical Association.

* * *

The paragraph referred to made mention of the state society publication known as the *Annual Transactions*, and called attention to the fact printed in volume one, edition of 1873, that of the 195 members there listed, only seven were residents of southern California: four of these being from Santa Barbara County, two from San Diego County, and only one from Los Angeles County!

By contrast, the 1928 state directory of the California Medical Association shows that of the total membership in the society, some 2217 members are from the ten southern counties (including in that group the counties of San Diego, Riverside, San Bernardino, Imperial, Los Angeles, Santa Barbara, Ventura, Orange, San Luis Obispo, and Kern), the remaining 2194 members being from the forty-eight counties north of the Tehachapi.

This new distribution of state society membership is explained, of course, on the basis of the increasing population growth in southern California, due to the various factors already mentioned, plus the changes made in topographical environment by bringing water to what previously could be called little more than grazing, waste, or desert land areas.

* * *

From its founding up to the reorganization of the state medical association in 1901, when it was necessary to comply with the new regulation of the American Medical Association permitting the recognition by state associations of only one component medical society in any county, the membership rosters of the California Medical Association show that it was practically a northern California society; its counterpart or analogous organization in the south being the Southern California Medical Society, which came into existence in 1888.

On April 6, 1888, the proposal was put forward in the Los Angeles County Medical Association to organize a district medical society, and on June 8, 1888 the Southern California Medical Society came into existence, with forty-eight charter members distributed as follows in the then southern counties: Los Angeles, 37; San Diego, 6; San Bernardino, 4; and Kern, 1.

In that same year, of the 416 members in the state medical association, only forty-one were from the South, by counties being credited: Los Angeles, 23; San Diego, 11; Santa Barbara, 4; Orange, 2; Kern, 1.

The dental profession has had a somewhat similar experience, and in California still presents two large dental organizations, one for the region north, and the other for the district south of the Tehachapi.

* * *

The official register of physicians and surgeons in the state of California of date of January 31, 1885, as compiled by the Board of Medical Examiners of the Medical Society of the State of California, prints a copy of "An act to regulate the practice of medicine in the state of California," which became a law on April 3, 1876, and which was amended on April 1, 1878; those statutes making official recognition of the corporations known as "The Medical Society of the State of California," "The Eclectic Medical Society of the State of California," and "The California State Homeopathic Medical Society," and providing for the appointment of the state examining board by those organizations.

The official register of 1885 contains the following interesting items:

"The number of certificates issued by the Board of Examiners of the Medical Society of the State of California, to date (1885), is 1698; number issued by the Homeopathic Boards, 217; number

issued by the Eclectic Board, 294; total number issued by the several boards, 2209.

"Total number of legal practitioners in the state, 1663. The number of persons practicing medicine in this state without a license, 485. Total number practicing in this state, 2148. The estimated population of the state is 1,036,298. Proportion of population to each licentiate of this board reported in this state, 838 +."

* * *

The last directory issued by the present Board of Medical Examiners of the State of California, which appeared on March 3, 1927, shows that in California a total of 9193 physicians and surgeons are now on the active list of the state board. Of that number 7699 physicians and surgeons are residing within the confines of the state. The estimated population at this time exceeds 4,500,000.

These last figures make an interesting contrast to those just mentioned, and which were taken from the 1885 reports of the state examining board.

* * *

Forty years have come and gone since 1888, and in these four decades California has been the scene of a transformation that is almost staggering when the wonderful changes that have everywhere taken place are contemplated.

These notes are here made not only to call attention to facts such as above are briefly indicated, but particularly to remind all members who may know of documents or publications which could shed light on the earlier days of medicine in California to at least write to the central office of the Association in regard thereto.

The special committee on archives and history of the California Medical Association, of which Dr. Emmet Rixford of San Francisco is chairman, would then be in a position to avail itself of such data in the compilation of historical material which is now being gathered.

THE TUBERCULOSIS PROBLEM OF CALIFORNIA—AT PRESENT AND IN RETROSPECT

When the history of preventive medicine in America is written, the chapters devoted to the important part played by the antituberculosis agencies, of necessity will find a place in more than one chapter of such a chronicle.

For it must be remembered that after what might be called the sanitary engineering impetus given to modern preventive medicine, which came about through the publication of the reports on the conditions of wage-earners in England about the year 1850—and the later vastly broader insight concerning the causative agents of infectious diseases, as developed in 1870 to 1900 through Pasteur's researches and the new science of bacteriology—there came into consideration a third vital factor in public health progress, which might be termed the human or social service element; this new factor finding its special and greatest development in the efforts to overcome the unnecessary deaths caused by that ubiquitous disease, tuberculosis.

* * *

The immense progress made in the prevention of infectious diseases—through measures which were not only aimed at elimination of inciting germ causes but also at contributory social deficiency factors—and which progress has been such an outstanding phenomenon in all civilized countries during the last quarter of a century, has been particularly associated with the disease, tuberculosis. In addition the educational campaign on measures designed to aid in lessening the ravages caused by the great white plague were carried out in such comprehensive and thorough manner that lay citizens as well as medical men were educated and enlisted in large numbers to do their respective parts in the preventive work.

* * *

Twenty-five years or so ago California had morbidity and mortality statistics relating to tuberculosis that gave the state, and especially its southern section, a quite unenviable reputation throughout the East. Today, when the splendid progress in antituberculosis work which has been made in these recent years of concentrated effort is noted, it is gratifying to realize that through volunteer physician workers California early took up the serious consideration of that important public health problem, the Southern California Antituberculosis Society, founded by Dr. F. M. Pottenger, being about the seventh organization to come into existence in the United States.

* * *

It is interesting to look back at the efforts of those days and to note how the continued work in the efforts and for the measures then brought into existence have resulted in such splendid results for our state. At that time, before the advent of the American Red Cross Christmas seals, which today are the means of replenishing to large extent the treasuries of the local agencies dealing with tuberculosis, the writer devised two such stamps at the Yuletide season for the California association; stipulating also that in the circularization of those stamps in Los Angeles city and county, that one-half of the net proceeds should go to the state tuberculosis association so that its educational and propaganda work might be carried to other portions of California.

* * *

Through the continued agitation as to its purposes and in the publicity given to the clinics which it sponsored, what might be called the paper state tuberculosis organization secured an appropriation from the California legislature of 1911 which enabled the State Board of Health to cause a special investigation into the tuberculosis problem of California, to "ascertain the effects of localities, employments, conditions and circumstances upon the health of those developing the disease, and to determine the best means for its eradication. To this end a commission consisting

of an executive board of five members and an advisory board of fifty members was appointed by the State Board of Health to carry on this work."

* * *

The writer had the honor to be elected chairman of that commission, its report being printed by the California State Printing Office in 1914.

In essence that report laid "special stress upon the importance of the county and city governments taking up the tuberculosis problems as community rather than as purely state problems," and particularly recommended a Bureau of Tuberculosis as a new department of the State Board of Health; as well as a revolving state fund designed to encourage county boards of supervisors to provide better aid to the indigents suffering from tuberculosis who were admitted to county hospitals.

* * *

The state tuberculosis association from the very beginning worked hand in hand with this newly established bureau, and through all these following years has given whole-hearted support to private and local community as well as to state efforts aiming to lessen the incidence of tuberculosis among our citizens.

* * *

The charts which have been published by the California State Board of Health show that the tuberculosis death rate of 225 per 100,000 population in 1916 was reduced in twenty years to lower than 140 deaths per 200,000 population. In the period 1906 to 1921, a period of fifteen years, some 14,469 lives were saved through the better hygienic and therapeutic measures largely brought into being by the joint efforts of the California Tuberculosis Association and the Bureau of Tuberculosis of the California State Board of Health.

* * *

These facts and figures are given because all this is creditable to California citizenship and particularly to the small group of medical colleagues and their lay associates who in the last score of years have most generously given of themselves so that this good work might be adequately supervised and carried on.

The statement has been made from time to time that this comparatively small group of workers have had only a handful of persons at the annual meetings, but that fact does not detract but rather adds to the credit which should go to these colleagues. Their unselfish loyalty to the cause, their willingness to give intelligent and broad-visioned service to the continued development of this important work, have been important elements in accounting for the beneficent results which are now so much to the credit of California.

The influence of those leaders, many of whom have been identified with the work almost from the beginning, has been a large and a determining factor in giving boards of supervisors a proper orientation of this important public health problem; and explains in good part why and how those officials in many counties in our state passed the necessary laws for the erection of the many modern sanatoria which have taken the place of what might be justly called the black death rooms of the old tuberculosis wards which existed in some of our larger county hospitals only two or three decades ago.

* * *

Today the recommendations of the California State Commission made in 1914 have been copied by more than one state in the Union, because of their soundness and practical value. Those measures, with the passing of the succeeding years, have given evidence of merit far greater than even their sponsors imagined them to possess.

In the year 1928, California handles this important tuberculosis problem not on a state sanatorium basis, but as a community county problem, which is as it should be. As a result, some of the most up-to-date and efficient public sanatoria in America have been and are still being erected in California.

The annual governmental appropriations to these California institutions represent the interest money on what would be an endowment of more than thirty millions of dollars, a sum of money which would never have been raised had the agitation been confined to efforts to secure donations from private citizens.

These splendid results in the prevention of tuberculosis, which all these things represent in the public health work record of California, should give all citizens a feeling of pride; and we who are also physicians may feel especially so in the knowledge that from the beginning the leadership in this altruistic and humanitarian endeavor has been particularly associated with medical men, and the executive associates whom they chose as being well fitted to aid in carrying on the work in efficient manner.

Compensation for Child Workers, Illinois — On July 1, 1927, the new provisions of the Illinois Workmen's Compensation Act came into effect, under which illegally employed children who are injured in industrial accidents are now entitled to the benefits of the act and will also receive compensation amounting to one and a half times as much as they would have received if they had been legally employed. Before this legislation was passed illegally employed children had no rights under the compensation act but had to bring suit against their employers under the common law in case of injury. This remedy, however, was tried in comparatively few cases because of the cost, uncertainty, and delay of court procedure. It is expected that under the new law employers will observe more carefully the state child labor law and will demand adequate proof of age from their minor workers.—U. S. Department of Labor.

"Mothers' Aid" Granted by Institutions—Four institutions conducted under church auspices in North and South Carolina, finding that some children for whom institutional care was requested could be cared for in their own homes if the mothers had the necessary means to support them, are now giving "mothers' aid" in such cases. South Carolina is one of the six states which at present has no law granting aid to children in their own homes.—United States Department of Labor.

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Current comment on medical progress, discussion of selected topics from recent books or periodic literature, by contributing members.

Industrial Medicine

Studies in Prevention of Toxic Hazards—Preventive medicine in industry has been given a definite impetus and the general interest in preventive methods has been heightened by the conclusion of a study of benzol poisoning conducted by the National Safety Council. Two significant points in this investigation are emphasized by Winslow[1]: (1) that this great organization representing industry has itself conducted the research and has now entered the field of industrial poisoning, which is allied to safety and accident prevention; (2) the use of thorough research methods in a quantitative rather than qualitative study. It is interesting also to note that since this investigation was made, there have been two others; the work of the United States Public Health Service on tetraethyl lead and the spray painting study by the Pennsylvania State Bureau of Labor and the National Safety Council. Incentive to further work along preventive lines is thus given by these excellent endeavors to circumvent industrial hazards.

Winslow has called attention to two classes of uses of benzol. First, there is the group of industries where the nature of the work demands a closed pipe line system, such as (1) the distillation of coal and coal tar in making benzol, (2) the blending of motor oils, and (3) the chemical industries, which embrace oil extraction, dye and dye intermediates, paints, varnishes, stains, and paint and varnish removers. The second group is represented by processes essentially characterized by the slow or rapid evaporation of benzol, such as in (a) the rubber industry, (b) in the manufacture of artificial leather, (c) in dry cleaning, (d) in sanitary can making, (e) as a solvent or vehicle for paints, varnishes and stains.

The report contains a number of protective suggestions, among them (1) the regular and systematic inspection of closed pipe lines or containers, (2) the freeing of receptacles of benzol vapor before entering them, (3) protection for workers who enter such enclosed spaces by the use of pressure air helmets or hose masks and by work in teams, (4) the diminution to exposure by the use of enclosed processes wherever possible, (5) the use of proper exhaust systems in removing vapors. No great reliance should be placed on masks and respirators, (6) a thorough medical examination before employment, excluding those who show organic lesions of heart, lungs or kidney, any hemorrhagic tendency, and anemia or unusual blood picture, (7) re-examinations with a systematic blood count every month during employment, (8) transfer to nonbenzol department of any employee who shows hemorrhages from mucous membranes of any organ or a decrease of white or red cells to the amount of 25 per cent or a hemoglobin below 70 per cent.

A very important development of this research study was the announcement that experimental work on animals has shown that *there were three other solvents that produced no constitutional symptoms when injected into the animals,* except for transient lessened activity, slight loss in weight and only a slight temporary reduction in the number of red and white cells. Inhalation experiments brought out these same facts even more clearly. *These three solvents are toluol, xylol and Hiflash naphtha.* The Council particularly urges manufacturers to use these relatively less harmful substances wherever manufacturing conditions make such a substitution possible.

C. O. SAPPINGTON, Oakland.

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1. Winslow, C. E. A.: Summary of the National Safety Council Study of Benzol Poisoning. Journ. Indust. Hyg., 9:61, February, 1927.

Proctology

Diverticulosis—Diverticulitis—It is not known how diverticula of the alimentary canal are formed but they occur in some part of the alimentary tract from the pharynx to the rectum. Undoubtedly some are congenital, as they may occur in early life and the pouches are then formed, by every layer constituting the normal bowell wall. Those which are a herniation of the mucous membrane through the muscular coats to a final association with the peritoneum, are acquired. These are probably a result of two factors: (1) weakness of the walls, especially at the attachment of the fat-laden appendices epiploicae or at the entrance or exit of the vessels: (2) increase of intraintestinal pressure associated with constipation or gaseous distention.

Spriggs and Marxer[1] describe from x-ray appearances: (1) A prediverticular state, when the normal segmentation of the bowel is absent, this being replaced by a ragged outline of little convex irregularities. (2) A stage of irritation following No. 1 represented by a concertina-like replacement of the smooth haustra. (3) Developed pouches or diverticula. (4) Diverticulitis or in-

flammatory processes arising about the necks of the pouches.

The findings of the roentgenologist are, therefore, very definite and are the only means of making a diagnosis unless diverticula are found during an abdominal operation.

Diverticula occur principally in the descending and pelvic colon, but may be found anywhere in the large bowel, and the appendix is not infrequently the seat of these pouches where they may produce symptoms resembling those of chronic appendicitis. Also it is not improbable, as Moynihan [2] remarks, that multiple rectal fistulae may be due to infection and rupture of rectal diverticula. Simple diverticula give rise to vague abdominal distress or gaseous distention in some part of the colon with some tenderness over the bowel, and these symptoms are accompanied or exaggerated by constipation. Diverticulous patients are on the average over fifty years of age. Treatment consists in prevention of infection of the pouches by removing systemic foci of infection, keeping the bowel evacuated by saline enemata and liquid petroleum and setting the somewhat spastic bowel at rest with atropin. An abdominal belt is useful, but massage of the abdomen should never be practiced.

Should diverticulitis supervene it will manifest itself as:

1. A "left-sided appendix" (acute infection of a pouch).
2. Peridiverticulitis, a hyperplastic inflammatory reaction around a number of diverticula producing a thickening of the bowel resembling carcinoma of the colon.
3. Inflammatory cicatrization of the diverticulous area producing stenosis and obstruction.
4. Abscess formation from localized penetration.
5. Perforation and peritonitis.
6. Perforation and fistulae formation of which vesicocolic fistulae are the commonest.

These secondary results may be retarded or even prevented by careful hygiene of the colon during the prediverticular or diverticular stage.

M. S. Woolf, San Francisco.

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Orthopedics

Heliotherapy in Joint Tuberculosis—Allison [1] has investigated this subject with his usual thoroughness, he having apparently visited the various centers in Europe, where the treatment is carried on most enthusiastically. He and his associates have practiced heliotherapy at the Peabody Home near Boston for a number of years.

Allison, who has done remarkable research work in bone tuberculosis, accepts the claims of brilliant cures by Rollier, Gauvain, and others, but leaves the reader in doubt as to his own faith in the treatment, and as to just what it accomplishes, and how. He says: "Heliotherapy, therefore, to our minds is a composite of many things which are aside from the light element, not in any way connected with the sun's rays." Others are not so cautious. They ascribe the cure directly to the sun's rays, and even specify as to which rays of the spectrum work the cure. According to one writer the short rays of the spectrum are the beneficial ones; according to another, the long rays. One says that the pigment of the skin keeps out the harmful rays, another says that it allows penetration of the healing rays.

Rollier, of course, maintains that the best results are to be obtained at the altitude where his sanitarium is located. The unregenerate inquires how many altitudes he tried before finding the correct one, or what chance helped him to find the exact spot at the first attempt. Allison believes that Gauvain gets as good results as Rollier at a less altitude. It is hard to tell exactly where the truth lies when authorities differ.

The point is, what shall we in California do with our tuberculous joints? We have such a range of climate and such difference in altitude that the decision of the proper place for treatment is difficult. Most of us have been unable to verify Rollier's claims. Possibly the safest way is to send all patients to Rollier, for his statistics are best.

For those unable to go on account of financial reasons, we can offer the following facts and theories in the line of consideration: Many sure cures have been promulgated for joint tuberculosis in the past thirty or forty years. Our perspective will improve if we look some of them over.

The most logical treatment is the operative treatment. If we clean out all the diseased tissue, and provide by drainage for the eventual exit of the rest, we would seem to be on the right track. At one time this was standard therapy, but it killed with such regularity that its vogue has almost passed. So bad were its results that many surgeons resorted to amputation as soon as they made the diagnosis of tuberculosis. Most of us would like to try something else first.

The injection treatment of tuberculous joints we always have with us. It is endemic, but when some investigator promulgates a new substance for injection or some new method of employing an old substance, this treatment becomes epidemic. Some years ago I searched the journals for references on the injection treatment since Mikulicz first advocated iodoform in 1881. Here are some of them: bone charcoal, iodin, phenol, arsenious acid and corrosive sublimate, acidulated solution of calcium sulphate, zinc chlorid, balsam of Peru, naphthol camphor, and formaldehyd solution. At present the injection treatment is not in good

repute, but we may safely prophesy a recrudescence before long.

The tuberculin treatment was brought out with a great flourish of trumpets. I believe it is still employed in some quarters, though it has been rather generally discredited.

Some twenty-five years or so ago Calot extolled the healing powers of salt water, combined with certain special plaster of Paris dressings, and if necessary, injection of certain substances into the cold abscess. Calot had quite a vogue. Hospitals were established at the seashore in many places. I had the luck to be in charge of the hospital at Coney Island for a number of years. Our patients had the best of food and care, and generally did well, but the joint tuberculosis ran its accustomed course. To San Franciscans, Calot's treatment will bring back fond memories of Salt Water Keck.

In a state medical meeting I have heard a man of some local prominence detail his cure of joint tuberculosis by painting with iodin, and by adhesive tape.

In the old days bitter fights were waged in orthopedic circles over the respective merits of braces and plaster of Paris. Those who advocated braces differed as to whether the apparatus should simply immobilize, draw the joint surfaces apart and immobilize, or draw them apart and allow motion—motion without friction, as it was called. The main thing was to devise some apparatus with some new gadget which helped in some mysterious way to cure the tuberculous joint.

All these cures had one thing in common: they were based on the clinical opinion of their originator, and no facts supported them except the before and after picture. Peruna has that. However, there is no particular reason why one should not try these various treatments as they come out, if one wishes. Occasionally one stumbles on the truth in that way.

If we are unwilling to pursue the hit or miss course, it might be well for us to demand of the advocate of a new treatment for tuberculous joints the same proof we demand in the case of other organs. If one appeared before a medical society claiming that one could cure endocarditis by injecting something into the blood stream, or appendicitis with sunlight, one would excite derision. It might be true, of course, but some proof besides photographs and case histories would be necessary.

If heliotherapy cures tuberculosis of joints, it should be easy to demonstrate the fact in animals. In all the years of its profitable exploitation this has never been done. Some of the same photographs of miraculously cured patients have been used year after year in different articles, and not one word of proof as to the correctness of the diagnosis, or positive examinations of tissues, or guinea-pig tests, has been submitted. If there is one thing established by careful investigation, it is that a diagnosis of joint tuberculosis without the demonstration of the tubercle bacillus cannot be made. If any clever surgeon doubts this let him take his operative material to the laboratory and look it over.

If he will do that he will learn much more than the fallibility of his diagnosis, for instance this fact: that everything which takes place in and about a tuberculous joint can be interpreted as nature's effort to cure it by destroying function. If he is wise he will imitate nature in his therapeutic efforts, and will view wonder cures with doubting eyes.

LEONARD W. ELY, San Francisco.

REFERENCE

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Urology

Chronic Prostatitis—Chronic prostatitis is an exceedingly common disease. It is usually accompanied by vesiculitis. From the resulting prostatovesiculitis much of the pain and worry of man arises.

There are two types: the infective, an aftermath of a gonorrheal infection, and the so-called "aseptic" type, which is more a congestion of the prostate and vesicles than an infection. The latter condition is much more prevalent than is ordinarily supposed, 15 to 25 per cent of cases of prostatitis being non-venereal in origin.[1] Sexual excitement without relief of congestion by a subsequent ejaculation is a frequent cause.[2] Sexual excesses, especially when accompanied by overindulgence in alcohol, masturbation, withdrawal, and other sexual irregularities, will produce this aseptic prostatitis.

Rectal palpation in the chronically infected prostate reveals small hard areas of induration with softer areas between; vesicles are hardened and distended. In the "aseptic" prostatitis the congested prostate is quite large, boggy, and tender, and the vesicles are distended and often tense.

The symptoms of prostatovesiculitis are many and range from a slight "morning drop" and shreds in the urine, to nervous exhaustion. Back pain is the most pronounced and constant symptom, being present in 70 per cent of cases,[3] and the examination of a patient with this complaint is never complete without a thorough check of the prostate and vesicles.[4] Player found that 25 per cent of cases of backache were due to prostatovesiculitis.[3] In the majority of these cases the pain is referred, although a few are due to an arthritis, myositis, or sinusitis, with the prostate and vesicles acting as a focus. Inasmuch as the enervation of the prostate is sympathetic and para-

sympathetic, fibers ending in the prostate arising from the tenth dorsal to the third lumbar segments, the pain from a prostatitis may be referred to any part of the body which is supplied by these segments.[5] A sensation of fullness or an irritation in the perineum, and dull ache in the suprapubic region are symptoms often met with in prostatovesiculitis.[3]

The sexual neurasthenic or even the patient with lesser sexual symptoms is frequently an unwelcome visitor to the physician's office. There is usually a pathological condition causing the symptoms from which these distressed humans suffer, and very frequently this condition is a chronic prostatovesiculitis. Huhner[6] has found cases of sexual neurasthenia, severe depression, nervous exhaustibility and other sexual neuroses due to a chronic prostatitis or a congestion of the prostate; and has cleared them up with treatment for those conditions. The mental anxiety of the patient is far greater than the pathology in the prostate and vesicles would warrant. In some of these cases the patient has been worrying about his condition for years, and it is more difficult to put his mind at ease and convince him that his trouble is not serious than it is to cure the prostatovesiculitis present. These patients must be put on a rigid sexual program. Coitus at regular intervals is beneficial, but ungratified sexual excitement is very harmful, and the patient must be impressed with this fact. In the routine treatment of these cases, the manner in which the prostate is massaged is important. The vesicle on each side is stripped first by reaching as high as possible with the finger in the rectum, then each lobe is massaged with a downward and medial stroke. This expresses the secretion first from the vesicles, then from the prostate into the urethra.

Prostatovesiculitis, both infective and aseptic, is to be thought of in all patients who complain of back pain, of a sensation of fullness in the perineum or suprapubic region, and of sexual difficulties. By routine examination of the prostate the cause of many baffling symptoms may be discovered. Inasmuch as prostatovesiculitis is either caused or aggravated by ungratified sexual desire and sexual irregularities, rigid sexual hygiene is an important item in the routine treatment of these conditions.

ROGER W. BARNES, Los Angeles.

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1. Baker, T.: Prostatitis of Non-Venereal Origin, J. A. M. A., 85:1606-08, November 21, 1925.

2. Jameson, W. R.: Chronic Prostatitis, Southwestern Med., 10:434-39, October, 1926.

3. Player, L. P.: Prostate and Its Influence on Low-Back Pain, California & West. Med., 23:993-99, August, 1925.

4. Kutzman, A. A.: Back Pain of Urologic Origin, California & West. Med., 27:208, August, 1927.

5. Young, H. H.: Practice of Urology, Vol. 1, p. 197, 1926 edition.

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Nutritional Disorders

Migraine—Since time out of mind medical literature has been replete with discussions of migraine. Theories as to its causes are many. For its treatment the list of remedies is as long in number as they each and all are short in value Evidently the disease is much more common than is usually recognized. In its irregular manifestations it undoubtedly plays a much greater part in certain functional diseases than realized; and very often its presence so obscures the clinical picture that a diagnosis of certain organic lesions is difficult and uncertain. We must agree that the causes and cure of this affliction afford a worthy field for research.

A perusal of the literature together with a somewhat close study of clinical cases would seem to warrant several tentative conclusions as to its nature:

1. That it is a specific, inherited, constitutional disease or fault, and ordinarily not acquired.

2. That it is primarily and essentially endocrine in character; as evidenced by its hereditary nature, its relation to other conditions and states in which there is a recognized readjustment in the endocrine system, such as puberty, pregnancy and lactation, the climacteric, menstrual periods, artificial menopause, etc.

3. That either directly or indirectly it involves a specific liver dysfunction which is not explained by such terms as are ordinarily applied to liver disease, organic or functional.

4. That definite, metabolic disturbance is present probably as a result rather than as a cause, though a physiologically invigorated metabolic function tends to prevent or mitigate the migraine explosions.

5. That the sympathetic nervous system is involved, probably, however, through a correlation with the endocrine system.

6. That it often manifests itself in such way that its migraine character is not recognized. The typical headache syndrome being absent, and the outstanding symptoms being nervous irritability, inordinate exhaustion and insomnia, with a state of gastro-intestinal peevishness and rebellion. Careful inquiry into the family and early history of these patients, and in fact into that also of the great majority of our so-called neurasthenics, reveals a definite and often strong migraine background. This form of the disease might well be called irregular migraine.

I believe it can be made evident that each of these several tentative conclusions is consistent with the idea of a single endocrine and metabolic cause; and while the discovery of this specific cause of migraine is only less desirable than the finding of a specific remedy for its relief, yet until the former is revealed, it probably will have to be said of the latter that the time is not yet.

D. D. COMSTOCK, Los Angeles.

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OFFICIAL NOTICES

Rates of Hotel Senator

Reservations for the annual meeting at Sacramento, April 30 to May 3 inclusive, should be made early. Following are rates for rooms at Hotel Senator, convention headquarters, fifty-seventh annual session of the California Medical Association:

Single room with private bath, $4 per day.

Double room, twin beds, private bath, $6 per day.

Parlor and bedroom, two private baths, $15 per day.

All of the rooms at Hotel Senator are outside rooms with private baths.

Interfraternal Banquet—The members of the several medical fraternities now located in Sacramento are planning an interfraternal banquet to be held on the first day of the coming session of the California Medical Association. The purpose of this gathering is to renew our old acquaintances and meet the newer brethren, and in this way bring about a more intimate association during the meeting from April 30 to May 3.

We would like to hear, by postal, from the members of the different medical fraternities who expect to attend the meeting in Sacramento so that arrangements can be made accordingly.

The members of the committee in charge are Drs. C. B. Jones (chairman), E. W. Beach, Orrin Cook, Frank Reardan, and George A. Foster.

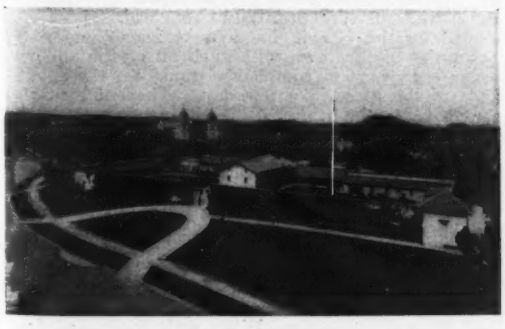
Train Service

Sacramentoan — The Sacramentoan is a Southern Pacific day train, with direct service between Sacramento and Los Angeles. Leaves Los Angeles in the early morning and arrives in Sacramento on the evening of the same day.

New train schedule, effective on March 1, will be printed in the April issue of CALIFORNIA AND WESTERN MEDICINE.

Early Medical History of Sacramento

Sacramento, the meeting place for the fifty-seventh annual session of the California Medical Association, began its career with a health problem of terrible magnitude. Today, seventy-eight years after this devastating scourge of Asiatic cholera, the following excerpt from the history of Sacramento by Thompson and West taxes credulity. Those who attend the annual meeting in April may well contrast Sacramento of 1849 with Sacramento of 1928 and the health situation of 1850 here graphically described with that of today.



Sutter's Fort

The Cholera in Sacramento

The cholera made its first appearance in Sacramento on the 20th of October, 1850, when an immigrant by sea was found on the levee, in the collapsing stage of the disease. The infection was brought to San Francisco on the same steamer which conveyed the intelligence of California's admission to the Union, and reached Sacramento before the city had recovered from the demoralizing effects of the squatter riots. As usual in such cases the local papers endeavored to conceal the extent of mortality, and their files of that date give no adequate idea of the fearful scourge. On the 24th of October, the city physician reported seven cases of cholera to the council, five of which were fatal. Some of the doctors attempted to quiet public apprehension by the opinion that the malady was only a violent form of the cholera morbus, and the *Times* "felt confident that there was very little danger, and had not heard of a single case where the patient had not been previously reduced by diarrhea." On the 27th, six cases were reported, and the *Times* "hoped that some precautionary measures would be taken," etc. On the 29th, twelve cases appeared; on the 30th, nineteen, and it was no longer possible to conceal the presence of the ghastly destroyer. A Sacramento correspondent of the *Alta*, November 4, says: "This city presents an aspect truly terrible. Three of the large gambling resorts have been closed. The streets are deserted, and frequented only by the hearse. Nearly all business is at a standstill. There seems to be a deep sense of expectancy, mingled with fear, pervading all classes. There is an expression of anxiety in every eye, and all sense of pecuniary loss is marked in a greater apprehension of personal danger. The daily mortality is about sixty. Many deaths are concealed, and many others are not reported. Deaths during the past week, so far as known, 188."

On the 14th of November, the daily mortality had decreased to twelve, and on the seventeenth the plague was reported as having entirely disappeared.

The precise number of deaths resulting from cholera can never be known, as many were returned as having died of dysentery, fevers, etc., for the purpose of quieting public apprehension, and no exact records of the event are accessible. The only reliable account extant was written by Dr. John F. Morse, ten years afterward, for Colville's Directory. Doctor Morse was one of the most active and humane physicians during the prevalence of the calamity, and parts of his narrative are almost too shocking for transcription here; but no one who ever knew that good man will think of calling in question his credibility, now that he, too, has passed away. Having referred to the general rejoicing on the admission of California to the Union, Doctor Morse continues: "But, alas! the exuberance of spirit thus enkindled, the joyous and buoyant feelings thus excited, were but the illusive precedents of one of the most appalling calamities

Sacramento, 1849

that had ever yet set its seal of distress upon the destiny of the Valley City.

Every successive day brought intelligence from the bay that the newly arrived passengers were still dying with cholera. In the feverish state of mind that existed in the community, there was no hope of escape. This alone, with the direction then given to fears, was sufficient to coerce the disease into a terrific development. It scarcely required an imported case to establish a panic more to be dreaded than its cause. But the first case that occurred was a steerage passenger of the steamer which brought the disease. Early in the morning of the 29th of October, a person was found on the levee in the collapsing state of the malady. Medical aid was administered, but the disease had taken too deep a hold of its victim. I saw him at sunrise; he was then expiring from the effects of the disease. The indications presented by his death were not calculated to abridge the depressing fear in the community. The cholera was now indeed in our city, and from mouth to mouth the story was communicated, so improved in all the features of a horrible description, as to darken the city with the very pall of death in a few hours.

In six days from the time of its inception it was making such progress that regular burials were but slightly attended to, and nursing and attention were not unfrequently entirely overlooked. Money could scarcely buy the offices of common kindness, and affections were so neutralized by the conflicting elements of selfishness that but little could be done to arrest the course of the disease. The victims of the malady did not seem to be confined so much to those of intemperate and irregular habits, as had been the case in almost all previous manifestations of the disease. People of the most industrious, careful and regular habits seemed alike vulnerable to the dreadful enemy. In a few days many of our most substantial citizens were numbered among the victims of the sweeping epidemic. It was reported that 150 cases occurred in a single day; but such was the confusion and positive delirium of the community that no proper records were made, nor can any accurate data now be found in respect to the epidemic of 1850. As soon as the daily mortality became so great as to keep men constantly employed in carrying away the dead, the citizens began to leave the town in every direction, and in such numbers as to soon diminish the population to not more than one-fifth of its ordinary standards. In this pestilential reign of terror and dismay the most dreadful abandonments of relatives and friends took place. Those who were willing to forget self and become the visitants of mercy constituted but a small and meager proportion of the many, who, following the instincts of nature, sought only to preserve themselves. There were a few men, as there always will be, whose warm hearts throbbed with an uncontrollable anxiety to convey relief to the distressed and the dying, and who lingered around the death scenes of the epidemic, so spellbound by sympathy that they endured anything and everything as long as there remained a solitary hope of even palliating the agony of dissolving nature. These men are found by and are known to those who constitute the heroes of epidemics. They consisted of an occasional brother, whose inwrought feelings of fraternity were sustained by a maternal bias that made them as enduring as life. I will mention one name, my motive for which will be readily acknowledged more as the extortion of truth than the result of partisan partiality—that of John Bigler, the present Governor of California. This man, with strong impulses of sympathy, could be seen in every refuge of distress that concealed the miseries of the dying and the destitute. With a lump of gum camphor now in his pocket and anon at his nostrils, he braved every scene of danger that presented, and with his own hands administered relief to his suffering and uncared for fellow beings.

The rapid spreading of the epidemic gave to the physicians of the city no rest, day or night. As might be expected, they were falling like the foremost soldiers of a desperate charge, and ere the cholera had subsided, seventeen of their number were deposited in the Sandhill Cemetery of our city. A professional mortality never before known; an inroad of death from which but a fraction more than two in three escaped with life, and not one in three from the disease! And yet, not a single educated physician turned his back upon the city in its distress and threatened destruction.

This awful calamity lasted in its malignant form only about twenty days; but, by the unsystematic records of the times, the number of deaths cannot be ascertained. Besides those who died in the city, many were overtaken by death in other places, and upon the road, in their desperate efforts to escape by running from the enemy. In the latter part of the epidemic the authorities procured the use of a large frame building on L Street, where the destitute cholera subjects were taken and provided for. The abatement of the disease was much longer than the period of its inception and increase, and commenced just as soon as the frequency of death had familiarized people with the frightful scenes around them, and rendered them less defenseless from a paralyzing fear. By the time the disease had almost disappeared the city was nearly depopulated, and there were not a few who thought the Levee City was dead beyond the possibility of resurrection.

But those who supposed that Sacramento and Sacramentans could be so easily crushed had not learned their character. The very moment mortality began an obvious retreat from the premises, that moment those who survived their flight returned. Those who abided by the city in its distress reacted upon the calamities of the town with such an elastic and vigorous energy as to completely transform the appearance of the place in a few days. The confidence of the people in the health of the city was almost immediately restored, and business communications were reopened with the mines under the most encouraging circumstances. For a few weeks a good business was realized, and the broken and beautiful winter that followed imparted a vitality to the town that could not have been anticipated by one who had contemplated its destiny through the gloomy scenes of October."

The present writer, who was one of the hardly surviving victims of that swift and terrible scourge, can certify that Doctor Morse has not overdrawn the horrors of the situation. What with floods and fires, insurrections and the plague, the very stars seemed to fight against Sacramento in her infancy, and the foundation of her latter prosperity was laid upon the

ashes of her pioneers. Before the disastrous visitation of the cholera, Doctor Stillman walked through the Sandhill Cemetery and counted eight hundred graves that had not yet been sodded over, and how many more were added by the still more terrible destroyer is not found recorded in the history of the time. Of a company of forty men who came out from New Haven on the infected schooner Montague, more than half died after her arrival, and after her departure from Sacramento for Panama, the captain, second mate and six passengers died of cholera before leaving San Francisco Bay.

COMPONENT COUNTY SOCIETIES

CONTRA COSTA COUNTY

The Contra Costa County Medical Society held the January meeting on the 21st, at the nurses' home of the County Hospital at Martinez.

The subject of "Unresolved Pneumonia" was discussed by the members.

Those present: Drs. H. L. Carpenter, W. E. Cunningham, D. M. Keser, L. StJ. Hely, R. Powell, Richmond; F. L. Horne, W. A. Rowell, Crockett; S. N. Weil, Selby; J. Beard, E. B. Fitzpatrick, E. Merrithew, G. W. Sweetser, Martinez. Non-members—I. O. Church, Buckman, Martinez; E. B. Todd, Concord. Mr. Pomeroy, Martinez; Miss A. Driscoll, Richmond.

A great deal of inspiration and a desire to be better acquainted with the manner of publicly discussing subjects before the society resulted from this forum meeting. Dr. I. O. Church, the new full-time health officer of the county, was introduced by Doctor Hely. Doctor Church spoke of the amount of work that is yet to be done for the welfare of the county and asked for the cooperation of the doctors of the society. We are sure he will receive it.

A delightful luncheon was served by the nurses of the County Hospital.

* * *

A very interesting and instructive meeting was held by the Contra Costa County Medical Society on February 11 at the offices of Doctors Cunningham, Carpenter, and Bumbarner, in Richmond.

The subject of "Gall-Bladder Disease" was thoroughly discussed with reference to its etiology, diagnosis and treatment. A great amount of discussion was heard from all members present and a good deal of benefit was derived from it. Dr. E. A. Todd of Concord was voted into the society.

There is a good that comes from the new method the society has adopted in the presentation of subjects by the members themselves. There seems to be more interest and lively discussion by members heretofore unheard.

Refreshments were enjoyed at Martin's Grill.

The next meeting is to be held in Martinez, March 10.

S. N. Weil, *Secretary.*

FRESNO COUNTY

At the February meeting of the Fresno County Medical Society Dr. Wallace I. Terry of San Francisco delivered an interesting lecture on "The Surgery of Gastric and Duodenal Conditions." While the duodenal ulcer is the more common, Doctor Terry considers the gastric ulcer the more serious, since bleeding is more frequent, and 10 to 20 per cent become malignant.

Slides were shown to demonstrate the technique of gastric and duodenal surgery. This was especially appreciated.

John M. Frawley, *Assistant Secretary.*

LOS ANGELES COUNTY

Dr. F. W. Lynch, professor of obstetrics and gynecology at the University of California, was the principal speaker at a dinner meeting given in his honor by the Los Angeles Obstetrical Society on February 9. His subject was "Five-Year End-Results in Carcinoma of the Cervix Uteri." He detailed in a most convincing manner the results obtained with radium and with surgery during the period of 1916 to 1922. Thus far he has been disappointed in the use of radium in operable cases, but has found that in inoperable patients there is a salvage of approximately 8 per cent secured through radiation. Extensive surgery in the early cases still is the preferred choice. In the discussion Dr. Titian Coffey stressed the prophylaxis of cervical cancer by repair of the lacerations from childbirth. Dr. Albert Soiland stressed the increasing trend toward the use of radium.

Interesting case reports were presented: Dr. H. C. Seaver on "Dermoid Cyst with Perforation of the Small Intestine"; Dr. A. H. Zieler, "Sixty-Five Year Old Fetus"; Dr. Walter A. Bailey and Dr. Lawrence Parsons, "Chorio-Epithelioma Following Ectopic Pregnancy."

Over 150 members of the society and their guests attended the dinner. Doctor Lynch was made an honorary member of the society, the others being Dr. J. W. Williams and Dr. M. L. Moore.

William Benbow Thompson,
Secretary Obstetrical Section.

PLACER COUNTY

The January meeting of the Placer County Medical Society was held Saturday evening, January 14, in the beautiful new Highland Sanitarium at Auburn. Owing to the death of the late president, Dr. Robert J. Nicholls, Vice-President Dr. J. Gordon Mackay presided.

There were present the following members and visitors: Members—Drs. J. Gordon Mackay, Robert A. Peers, G. H. Fay, Monica S. Briner, C. C. Briner, S. Kalman, Mildred E. Thoren, R. H. Eveleth, C. E. Lewis, Max Dunievitz, and J. W. Russell. Visitors—Drs. Leo P. Bell, J. Edward Harbinson, E. Eric Larson, and John D. Lawson, all of Woodland; Dr. Thomas C. O'Connor, Jr. of Colfax, Dr. P. D. Barnes of Loomis, and Mr. Thoren of Weimar.

Dr. Thomas C. O'Connor, Jr. of Colfax was elected to membership in the society.

Resolutions on the deaths of Dr. Robert J. Nicholls and Dr. S. H. Rantz were read and adopted.

A literary program consisting of a symposium, Differential Diagnosis of Upper Abdominal Lesions, was presented by the members of the staff of the Woodland Clinic.

Dr. J. Edward Harbinson presented the medical side, discussing the various points of diagnoses of upper abdominal lesions, especially as to differentiation between carcinoma, duodenal and gastric ulcer, and cholecystitis with or without stones.

Considerable emphasis was laid upon the value of complete roentgen examination both by the opaque meal and the use of tetraiodophenolphthalein. It was pointed out that clinical history and physical examination are important points and that it is especially necessary to elicit the early symptoms of the disease, inasmuch as differentiation may be accomplished through this means.

The preparation for operation, in cases where that course seems to be advisable, was emphasized as well as the postoperative observation.

The speaker discussed very fully alkalosis as related to these conditions in both preoperative and postoperative cases. The blood chemistry and clinical findings attendant thereon were gone into in considerable detail.

Doctor Larson, considering the surgical side, began with a history of gastro-enterostomy, describing its evolution to the present methods of performing that operation.

Various types of operation used for the treatment of gastric ulcer and malignancy were noted, with the

observation that gastric resection is the operation of choice in both these conditions. For duodenal ulcer when there are indications against medical treatment, gastro-enterostomy is the operation of choice.

Pyloroplasty without gastro-enterostomy was mentioned as being a procedure, the wisdom of which is doubtful.

In treatment of gall-bladder disease cholecystectomy has been found to be advisable in all cases except in rather rare instances where the procedure would seriously endanger the patient's life, as especially noted in acute cholecystitis.

The symposium was closed by Dr. John D. Lawson, roentgenologist of the Woodland Clinic, who by means of lantern slides demonstrated the various types of lesions that occur in the upper gastro-intestinal tract, with especial emphasis on cholecystography in the diagnosis of gall-bladder disease as well as its value in demonstration of stones.

The very complete and illuminating symposium was generally discussed by the members present, particular interest being shown by those present in the speakers' description of the condition of alkalosis.

Following adjournment a luncheon was served by the management of the hospital.

ROBERT A. PEERS,
Secretary.

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SAN BERNARDINO COUNTY

Minutes of the meeting of the San Bernardino County Medical Society, held at the San Bernardino County Hospital, February 7, at 8 p. m.

The meeting was called to order by the president at 8:15. Minutes of the previous meeting were read and approved.

Doctor Moseley reported for the County Hospital committee. The report was accepted and the committee was discharged.

Doctor Curtiss reported for the committee on the revision of the constitution, and was instructed to make further report and submit concrete recommendation.

The communication from the Los Angeles Clinical and Statistical Section was read.

Announcement was made regarding prompt payment of dues.

The president reappointed the present milk commission. Doctor Finkleberg replacing Doctor Owen.

Doctor Abbott, speaking for the members in his locality, invited the society to hold its next meeting at the San Antonio Community Hospital. The invitation was accepted.

The program of the evening was then entered upon:

Radiographic Manifestation of Metastatic Malignancy—Dr. Carl H. Parker of Pasadena. Discussion opened by Dr. C. C. Owen.

Remarks on the Etiology and Treatment of Cancer—Dr. Montrose T. Burrows of Pasadena. Discussion opened by Dr. G. G. Moseley.

There were forty-two present.

Luncheon was served at 10:30 p. m. after adjournment of the meeting.

E. J. EYTINGE, *Secretary.*

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SAN DIEGO COUNTY

The completed lists of officers for 1928 for the following organizations are here recorded:

County Medical Society—J. M. McColl, president; L. H. Redelings, vice-president; W. H. Geistweit, Jr., secretary; Willard Newman, treasurer. Editors: Robert Pollock, W. H. Geistweit, Jr.

Council—L. H. Redelings, chairman; J. M. McColl, W. H. Newman, W. H. Geistweit, Jr.; William Belford, E. C. Lee, A. E. Elliott, R. Donnell, Martha Welpton, S. J. McClendon.

Membership Committee—S. J. McClendon, Frank St. Sure, S. J. Ratty.

Child Welfare—L. B. Mahan, E. B. Porter, Rieta Hough, B. F. Eager, Ross Carter.

County Hospital—W. H. Potter, C. O. Tanner.

Medico-Legal—Frank Carter, H. S. Anderton, W. D. Rolph.

Program—Ed Chamberlain, R. C. Lounsberry, W. O. Weiskotten.

Mercy Hospital staff officers—E. P. Chartres-Martin, president; Frank Carter, vice-president; C. O. Tanner, secretary.

Executive Committee—E. C. Lee, D. K. Woods, T. O. Burger, L. H. Redelings.

Scripps Memorial Hospital—H. G. Lazelle, president; Martha Welpton, vice-president; E. F. F. Copp, secretary.

San Diego County General Hospital—Fraser Macpherson, president; D. K. Woods, vice-president; J. C. Dement, secretary.

San Diego Medical Library Association—Dr. C. E. Howard, president; O. K. Bullard, D. D. S., vice-president; Dr. Willard H. Newman, secretary-treasurer; Mrs. Mildred Farrow, librarian; Doctors Howard, Hoover, Emery, Geistweit, Kyes, Bullard, E. J. Farrow, Lazelle, Pollock, Porter, Lounsberry, Walsh, directors.

Eighteen applications for membership in the Medical Society are at present under consideration.

The Academy Lectureship—The third annual course of medical lectures presented by the Academy of Medicine has passed into history, leaving us not only better informed, but with a keener desire for culture. Nothing could better express the interest of the profession in the ever present subject of tuberculosis than the large attendance which kept up throughout the week. Dr. Allan Krause has that magnetic hold on his audience which results from the impression given of authority to speak on a subject of which he is a master worker and faithful recorder. Night by night he led his hearers, many of whom came long distances to do him honor, through the intricacies of etiology, diagnosis and treatment, making the subject at each turn of the way seem simple beyond measure; until when he summarized the whole matter in a fascinating historical review punctuated with biographic milestones of our advance in an understanding of this gigantic subject, his listeners—specialists and commoners alike—were conscious of a renewal of pride in their humble part in so glorious a campaign. Nothing we can say would add to the luster of Doctor Krause; so we simply record the fact that we, the profession of San Diego, are glad to have had the privilege of sitting at his feet.

ROBERT POLLOCK.

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SAN FRANCISCO COUNTY

On March 1, 1928, the San Francisco County Medical Society will begin the publication of its monthly bulletin in an enlarged form, to contain, in addition to the usual information and scientific programs for the ensuing month, matters of interest to the members of the medical profession.

This enlarged bulletin will serve a useful purpose in enabling the officers of the society to place before its members those things which are being talked about in the society, plans for future development, matters relating to public health and anything of any importance to the medical profession.

News concerning the goings and comings of medical men will be published, and the medical golfers will have a column to themselves. In other words, the society hopes to have a family newspaper published monthly.

T. HENSHAW KELLY, *Secretary.*

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SAN JOAQUIN COUNTY

The regular meeting of the San Joaquin County Medical Society was held February 2 in the hall of

the Medico-Dental Club, 242 North Sutter Street. Dr. John J. Sippy, president, in the chair.

The meeting was called to order at 8:45 p. m., with an attendance of twenty-seven. Those present were: Drs. N. P. Barbour, J. W. Barnes, W. Biethan, C. O. Bishop, E. L. Blackmun, C. A. Broaddus, F. J. Conzelmann, J. D. Dameron, J. F. Doughty, L. Dozier, P. B. Gallegos, S. Hanson, J. P. Hull, H. E. Kaplan, B. M. Krout, G. McCoskey, R. T. McGurk, F. G. Maggs, D. R. Powell, G. H. Rohrbacher, G. H. Sanderson, J. J. Sippy, F. B. Sheldon, M. H. Smyth, A. L. Van Meter, G. J. Vischi, N. E. Williamson, and Dr. E. B. Towne of San Francisco, guest and speaker of the evening.

The minutes of the previous meeting were read and approved.

A communication from the secretary of the California State Medical Association was read relative to the proposed amendments to the Constitution and By-Laws of the State Association.

The president stated that he would call a meeting of the board of directors to consider the proposed amendments.

The Chair declared to be now in order for consideration the amendment to the constitution, contained in the following resolution proposed at the last meeting by Doctors Kaplan, Dozier, Sanderson, Holliger, and D. R. Powell.

"Resolved, That the officers of the San Joaquin County Medical Society be elected by a popular ballot;

That the president and vice-president serve, ex-officio, as members of all standing committees;

That the secretary of the society be a member of the board of directors;

That the nominations take place one month prior to the election and that the ballots be sent to all members of the society so that they can vote whether present or absent."

Dr. D. R. Powell spoke on the amendment proposed by this resolution and the method of considering it, and moved that a vote be taken to ascertain whether the society desires to elect officers from the members at large instead of, as at present, from the board of directors.

Motion seconded and carried.

The Chair then declared that the society desired to elect officers from members at large.

Dr. D. R. Powell moved that the Chair be authorized to appoint a committee of five to recast, with proper phraseology, the proposed amendment covering the nomination and election of officers as decided by the previous motion; and to present it for action at the next meeting.

Motion seconded and carried.

The Chair appointed as a committee, Doctors Kaplan, Dozier, D. R. Powell, Dameron, and Hull.

The two motions made by Dr. D. R. Powell accomplished the object of the resolution for amendment, and it was moved by Doctor Dozier that the amendment be tabled.

Motion seconded and carried.

The president commented on the untimely passing of one of our members, Dr. Charles E. Stagner, and announced that a floral offering together with a letter of condolence had been sent the bereaved family. He then presented Dr. E. B. Towne, who delivered a most interesting and practical talk on the subject, "Injuries of Peripheral Nerves."

"Good results may be expected if treatment is carried out systematically over a long period of time," said the speaker. Methods of examination of muscular action, electric response of muscles, and sensory functions were described. Treatment is operative and non-operative, and in every case there must be intelligent cooperation between surgeon, physiotherapist, and patient. The non-operative treatment consists in constant relaxation of the paralyzed muscles by proper splinting, and nutritional treatment to keep up the volume and tone of the affected muscles. This consists in the application of moist heat, massage, and assisted exercises after function begins to return. Indications and contraindications for operation were considered in detail. The fact that there is only one satisfactory method of repair, end-to-end suture of freshened nerve ends, was especially emphasized. All plastic operations are useless. Gaps may be overcome by loosening the nerve, relaxation by change of position of joints, transposition of the nerve or by two-stage operations. Using the musculospiral nerve as an example, some typical illustrations of cases were described, especially from the point of view of prevention of injury of that nerve. Doctor Towne briefly described the operation of trigeminal neuralgia as suggested by Spiller, and the good results that have been obtained from it. Many members asked questions, which the doctor answered in a most practical way.

There being no further business the Chair declared the meeting adjourned at 10:30 p. m.

FRED J. CONZELMANN, *Secretary.*

SANTA BARBARA COUNTY

The regular meeting of the Santa Barbara County Medical Society was held on Monday evening, February 13, at St. Francis Hospital.

The meeting was called to order by President Sansum.

The minutes of the December regular meeting and the January annual meeting were read and approved.

Doctor Kempf then gave a most interesting talk on "The Physical Basis of Functional Neuroses and Psychoses."

This was discussed by Doctors Van Paing, Brown, Nuzum, Williams, Lamb, and Koefod.

The society then went into executive session, and it was moved by Doctor Williams and seconded by Doctor Means, that the following resolution be adopted:

"Resolved, That the Nurses' Registry conducted by Miss Davis at the Cottage Hospital, and all other private Nurses' Registries, accept on their lists only those nurses who have registered with and are members of the Santa Barbara County Nurses' Association."

The transfer card of Dr. W. S. Franklin was read, and it was moved, seconded and carried, that he be admitted into the society.

It was moved, seconded and carried, that the resignations of Doctors Soper and Vandevere be accepted.

It was moved by Doctor Means and seconded by Doctor Henderson that Dr. Alex C. Soper be made an honorary member of the Santa Barbara County Medical Society and that he be notified of the same.

Copies of the proposed changes of the Constitution and By-Laws of the state society were referred to Doctors Ullmann and Nuzum.

The president appointed an auditing committee of Doctors Means and Williams to audit the books of the secretary-treasurer for the past year.

There being no further business the meeting adjourned.

W. H. EATON, *Secretary.*

SANTA CRUZ COUNTY

At the January meeting of the society it was decided to concentrate our efforts on quarterly gatherings during 1928. In order to make these meetings as complete as possible and assure a diversified program for the year, it was deemed advisable to have one member of the society act as a committee of one to arrange the scientific programs. Dr. J. C. Farmer of Felton will carry on this work during 1928.

The next meeting will be held in March under the auspices of the San Lorenzo Valley Chamber of Commerce and will probably take place in Ben Lomond, in the Santa Cruz mountains. Dr. J. H. Shepherd of

San Jose, our district councilor, will be with us at that time. Other speakers have not been decided upon as yet.

SAMUEL B. RANDALL, *Secretary.*

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STANISLAUS COUNTY

The February meeting of the Stanislaus County Medical Society was held at the Hotel Hughson, February 10, following the usual 6:30 dinner, Dr. J. W. Morgan presiding.

Those present were: Doctors Morgan, Maxwell, W. Smith, Allen, Cooper, Porter, Hennemuth, Surryhne, Finney, Jensen, McPheeters, Clark, Meyer, Reamer, Stewart, McKibbon, Mottram, Morris, Hiatt, and Faulkner.

The minutes of the previous meeting were read and approved. A letter from the California Medical Association was read officially notifying the component societies of the proposed amendments to the Constitution and By-Laws.

It was suggested that the March meeting be in charge of the members who are eye, ear, nose and throat specialists, and a committee was appointed consisting of Doctors Meyer (chairman), Porter, Reamer, Mottram, and Morris to obtain the speaker.

Dr. William B. Faulkner of San Francisco then addressed the society on "Thoracic Surgery" and showed a case of diaphragmatic hernia in which the stomach had reached the level of and was adherent to the clavicle, stating this to be the only case in the literature where the stomach had ascended so high. He showed many instructive slides of normal and pathological chests and spoke briefly on the surgical treatment of empyema and lung abscess.

Doctor Faulkner was given a vote of thanks and the meeting was then adjourned.

R. STEWART HIATT, *Secretary.*

CHANGES IN MEMBERSHIP

New Members

Alameda County—E. W. Ayer, Julius Montalvan, A. Lyle Winslow, Oakland; William E. Judson, Livermore.

Butte County—James G. Hepplewhite, Chico.

Contra Costa County—E. B. Fitzpatrick, Martinez.

Lassen-Plumas County—C. I. Burnett, Susanville.

Los Angeles County—V. L. Andrews, Frederick S. Balyeat, Stanislaus J. Becka, John Henry Clayton, Herbert R. Crase, F. H. Falconer, Lowrie Grow, Joseph J. Hilton, Edward H. Jacobs, O. Donovan Johnson, Raymond D. McBurney, Los Angeles; Henry G. Bieler, Pasadena; Clayton C. Campbell, Max Marks, Stirling Pillsbury, Long Beach; Yugve J. Nyvall, San Pedro.

Mendocino County—L. R. Leidig, Mendocino.

Merced County—Edward A. Jackson, Dos Palos.

San Francisco County—Henry P. Buckingham, Leo Garland, Adam A. Haas, Frederick C. Keck, Mary H. Loveless, Leo L. Meininger, Howard E. Newson, George P. Purlenky, Robert S. Sherman, Beverly Simpson, Mary J. Stiles, San Francisco.

San Diego County—Ross O. Taylor, San Diego.

Santa Barbara County—Frank G. Crandall, Francis J. Hombach, Clarence T. Roome, Santa Barbara.

Transferred Members

S. H. Babington, from Mendocino County to Alameda County.

E. R. Brooks, from Placer County to Alameda County.

Robert T. Boyd, from Mendocino County to Kern County.

C. R. Campbell, from San Bernardino County to Santa Clara County.

Lenore D. Campbell, from San Bernardino County to Santa Clara County.

A. N. Donaldson, from San Bernardino County to Santa Clara County.

S. C. Glassman, from San Bernardino County to Santa Clara County.

S. Kalman, from Siskiyou County to Placer County.

Norman D. Morrison, from San Francisco County to San Mateo County.

Christian A. Nies, from San Bernardino County to Los Angeles County.

Houston H. Parsons, from Los Angeles County to San Bernardino County.

W. W. Peterson, from Alameda County to Los Angeles County.

H. E. Price, from San Joaquin County to Los Angeles County.

Lewis H. Stanton, from Orange County to Los Angeles County.

Henry M. Thompson, from Los Angeles County to San Francisco County.

Resignations

Charles E. Mooser, Oakland.

John M. Schimmenti, Los Angeles.

Deaths

Fox, Willard Henry. Died at Los Angeles, December 7, 1927, age 66 years. Graduate of Albany Medical College, New York, 1888. Licensed in California, 1895. Doctor Fox was a member of the Los Angeles County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Goodrich, Edwin Gilman. Died at Los Angeles, age 61 years. Graduate of College of Physicians and Surgeons, University of Southern California, 1903. Licensed in California, 1903. Doctor Goodrich was a member of the Los Angeles County Medical Society, the California Medical Association, and the American Medical Association.

Halbert, Howard Valmore. Died at Los Angeles, age 32 years. Graduate of Rush Medical College, Illinois, 1921. Licensed in California, 1924. Doctor Halbert was a member of the Los Angeles County Medical Society, the California Medical Association, and the American Medical Association.

Nice, Downing Decatur. Died at Three Rivers, December 17, 1927, age 59 years. Graduate of College of Physicians and Surgeons, Keokuk, Iowa, 1890. Licensed in California, 1907. Doctor Nice was a member of the Tulare County Medical Society, the California Medical Association, and the American Medical Association.

Roth, Leon Joseph. Died at Los Angeles, January 30, 1928, age 55 years. Graduate of Medical Department, University Southern California, 1901. Licensed in California, 1901. Doctor Roth was a member of the Los Angeles County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Stagner, Charles Elmer. Died at Stockton, January 28, 1928, age 44 years. Graduate of Cooper Medical College, California, 1912. Licensed in California, 1913. Doctor Stagner was a member of the San Joaquin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Sutton, Irwin Coleman. Died at Los Angeles, January 25, 1928, age 32 years. Graduate of College of Physicians and Surgeons, Medical Department University of Southern California, 1919. Licensed in California, 1919. Doctor Sutton was a member of the Los Angeles County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Williams, Charles Crosby. Died at Los Angeles, January 18, 1928, age 73 years. Graduate of the Harvard University Medical School, Boston, Massachusetts, 1886. Licensed in California, 1899. Doctor Williams was a member of the Los Angeles County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

UTAH STATE MEDICAL ASSOCIATION

W. R. CALDERWOOD, Salt Lake.....President
E. H. SMITH, Ogden.....President-Elect
FRANK B. STEELE, Salt Lake.....Secretary
J. U. GIESY, 701 Medical Arts Building, Salt Lake.....
.....Associate Editor for Utah

OFFICIAL NOTICES

The following official bulletin has been issued by the State Board of Health for the information of the profession during the locally increased incidence of cerebrospinal meningitis in Cache County. We carry it to stress the points included in the interests of prevention:

Utah State Board of Health—Epidemic Cerebrospinal Meningitis—Threatening outbreaks of meningococcus meningitis (epidemic cerebrospinal meningitis) have appeared in several sections of the state, and the active cooperation of health officers, physicians, and citizens in general is urged for the prevention of the spread of the disease. With this object in view the following facts concerning the disease and approved methods of control are submitted for careful consideration and guidance:

Infective Agent—Meningococcus.

Source of Infection—Discharges from the nose and mouth of infected persons. Clinically recovered cases, and healthy persons who have never had the disease but have been in contact with cases of the disease or other carriers, act as carriers and are commonly found, especially during epidemics.

Mode of Transmission—By direct contact with infected persons and carriers, and indirectly by contact with articles freshly soiled with the nasal and mouth discharges of such persons.

Incubation Period—Two to ten days, commonly seven. Occasionally for longer periods when a person is a carrier for a time before developing the disease.

Period of Communicability—During the clinical course of the disease and until the specific organism is no longer present in the nasal and mouth discharges of the patient. The same applies to healthy carriers so far as affects persistence of infectious discharges.

Methods of Control—Early recognition of the disease—clinical symptoms, confirmed by the microscopic and bacteriological examination of the spinal fluid, and by bacteriological examination of nasal and pharyngeal secretions.

Isolation of the infected persons for fourteen days after onset of the disease and until the nasal and pharyngeal secretions are proved by bacteriological examination to be free from the infecting organism. Other members of the family to be forbidden to attend school, places of amusement or public gatherings.

Quarantine of carriers until the nasal and pharyngeal secretions are proved by bacteriological examination to be free from the infecting organism.

Search for carriers among families and associates of recognized cases by bacteriological examination of posterior nares of all contacts.

Education as to personal cleanliness and necessity of avoiding contact and droplet infection.

Prevention of overcrowding in living quarters and other places.

Concurrent disinfection of discharges from the nose and mouth and of articles soiled therewith.

Terminal disinfection—thorough cleaning, sunning and airing of house.

Immunization by the use of vaccines is still in the experimental stage.

The foregoing measures, which in part are supplementary to the official quarantine rules, are recommended for adoption during the epidemic prevalence of the disease in any part of the state.

The laboratory of the State Board of Health will promptly render bacteriological assistance upon the request of any physician or health officer. Instructions for collecting specimens for testing, etc., will be furnished when desired.

Immediate intraspinal injection of meningococcus serum is recommended in all cases of the disease; also the intravenous administration of the serum in severe septic cases. If used intravenously a preliminary injection of 1 cc. one hour in advance for desensitization is advised.

Until further notice health officers are requested immediately to report all cases and deaths to the State Board of Health.

T. B. BEATTY, M. D.,
State Health Commissioner.

January 19, 1928.

COMPONENT COUNTY SOCIETIES

SALT LAKE COUNTY

The annual meeting of the Salt Lake County Medical Society was held in the assembly room of the Medical Arts Building, Salt Lake City, Monday, December 12, 1927.

The meeting was called to order at 8:10 p. m. by President W. G. Schulte. Seventy-three members and two visitors were present.

The minutes of the previous regular meeting and the special meeting held December 5, 1927, were read and accepted without correction.

A. C. Callister presented a patient on whom he had operated for bilateral cervical ribs. Discussed by A. J. Hosmer.

The following men were unanimously elected to membership in the society: Charles E. Beymer, R. W. Quick, and Eugene Worley, by transfer from Cache County Medical Society.

A film entitled "How Biologicals are Made" was shown by courtesy of Parke, Davis and Company.

The proposed new constitution of the Utah State Medical Association was read by the secretary. The proposed amendment to the by-laws raising the dues from $10 to $15 was read by the secretary. This was voted upon and lost by a vote of forty-five to twenty-seven.

F. B. Steele moved that the Salt Lake County Medical Society waive jurisdiction over Doctor Goodwin, who resides in Park City. Seconded and carried.

President W. G. Schulte addressed the society suggesting that our finances be increased and as much business as possible be omitted from the meetings.

The annual report of the secretary was read by the secretary.

The annual report of the treasury was read by Joseph E. Jack.

Report of the proceedings of the House of Delegates of the Utah State Medical Association at their annual session of 1927 was read by Sol G. Kahn.

The following committees reported: Community Clinic by W. L. Rich; Public Health and Legislation by C. M. Benedict; Necrology by J. U. Giesy; Committee to Supervise Public Lectures, read by the secretary in the absence of Ralph Pendleton; Medico-Legal by M. C. Lindem; Library by W. R. Tyndale; Boy Scout by L. J. Paul.

L. J. Paul discussed W. L. Rich's report.

F. B. Steele moved that all committee reports be adopted as read. Seconded and carried.

Election of officers for 1928 resulted in the unanimous election of the following men: W. F. Beer,

president; C. M. Benedict, vice-president; M. M. Critchlow, secretary; Joseph E. Jack, treasurer; W. G. Schulte, censor.

W. G. Schulte delegated A. J. Hosmer and W. L. Rich to escort President Beer to the chair.

President Beer responded with a short speech.

Adjournment at 10:30 p. m.

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The regular meeting of the Salt Lake County Medical Society was held in the assembly room of the Medical Arts Building, Salt Lake City, January 9, 1928.

Meeting called to order at 8:05 p. m. by President William F. Beer. Forty-one members and one visitor were present.

Minutes of the previous meeting were read and accepted without correction.

The first paper on the scientific program was by W. E. Hunter on "Diaphragmatic Hernia." He reported three cases, two of which were congenital with rudimentary lungs, and one was traumatic. He discussed the causes and went into the embryology. Pictures and films were shown by L. A. Thody and discussed by G. B. Coray.

This very interesting paper was brilliantly discussed by George W. Middleton, who dealt on the embryology, anatomy, symptoms and treatment. There was further discussion by R. T. Richards, who reported a case of sarcoma of the lung which he removed and repaired the diaphragm with latissimus dorsi muscle.

The next paper was given by J. P. Kerby on "Eventration of the Diaphragm." He took up the literature on this subject and discussed the causes, illustrating his paper with films. This interesting paper was discussed by W. E. Hunter and G. B. Coray.

G. G. Richards announced the meeting of the American College of Physicians, March 5 to 9, at New Orleans.

President Beer announced the policy of the society during his incumbency and read the names of the personnel on the various committees he had appointed.

J. P. Kerby requested that every doctor threatened with malpractice suit or asked to testify in such a suit confer at once with the Medico-Legal Committee.

Adjournment at 9:30 p. m.

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The regular meeting of the Salt Lake County Medical Society was held in the assembly room of the Medical Arts Building, Monday, January 23, 1928.

Meeting called to order at 8:10 p. m. by President William F. Beer. Twenty-eight members and two visitors were present.

Minutes of the previous meeting were read and accepted without correction.

No clinical cases were presented.

F. B. Bailey read a paper on "Pneumonia." He discussed the various types, immunity, instances, diagnosis, prognosis and treatment by drugs and sera.

This very interesting paper was discussed by George F. Roberts, G. G. Richards, G. N. Curtis, L. N. Ossman, and S. C. Baldwin.

C. J. Pearsall was unable to read his paper on "Syphilis" because of illness.

Applications for membership signed by C. E. McDermid, W. J. Reichmann, and William R. Middlemiss were read.

Adjournment at 9:30 p. m.

M. M. CRITCHLOW, *Secretary.*

UTAH COUNTY

The Utah County Medical Society has had several interesting meetings during the interval since December.

January 11, Dr. Martin C. Lindem of Salt Lake read a very instructive paper on "Back Injuries" supplemented by x-ray plates.

January 25, Dr. J. L. Aird of Provo gave a "Review of Recent Medical Literature," and Dr. R. L. Hill of Logan discussed the "Physical Curd Character of Milk."

February 8, Dr. W. E. Hunter of Salt Lake read a paper on "Radiation in Gynecology," and Dr. W. R. Tyndale of Salt Lake discussed "Physical Therapy."

All meetings were held at the Hotel Roberts with a dinner preceding the scientific program, with the exception of the last, which was held at the Provo Physical Therapy Clinic, on the invitation of Dr. J. Nusink, who has recently established the clinic and who entertained the members of the local society on the night of February 8 as his guests.

ARNOLD E. ROBISON, *Secretary.*

WEBER COUNTY

The regular meeting of the Weber County Medical Society was held January 26, 1928, at the nurses' home, President W. R. Brown presiding.

At the suggestion of Dr. H. C. Stranquist a committee was appointed to audit the report of the treasurer for the last two years, Drs. E. P. Mills, Junior Rich, and A. H. Aland appointed on this committee.

Dr. W. H. Budge reported for the committee on "dead-beat accounts." He suggested that a list of names be formed each month by each doctor of "professional no-good accounts." This list will be mailed to an appointed secretary who will then make a complete list of the "dead-beats" for that month and mail a report of same to each doctor. That it be optional with the doctors about joining, and that a small fee be charged to cover the expense. Dr. A. H. Aland was appointed secretary for six months.

Dr. R. L. Draper's motion that a committee be appointed to draw up resolutions of sympathy for Dr. W. E. Whalen at the death of his father was passed. A copy of the same to be mailed to Doctor Whalen. The Chair appointed Drs. E. I. Rich and R. L. Draper on this committee. After some discussion it was the opinion of the society that the classification of diseases at the hospital be left to the executive staff of the Thomas Dee Memorial Hospital.

Dr. L. A. Smith gave a very interesting paper on "Nephritis in Children," classifying the disease, etiology and treatment. The acute hemorrhagic and acute and chronic parenchymatous are the two most common in children. He showed some interesting charts of changes noticed in the capillary nail bed that are associated with these two types of nephritis. The paper was discussed by Drs. W. H. Budge, A. H. Aland, and R. L. Draper.

Meeting adjourned.

GEORGE M. TEATER, *Secretary.*

NEWS

The January meeting of the Holy Cross Hospital Clinical Association was held the night of January 16, in the assembly room of the hospital. The following program was rendered:

Carcinoma of Bladder, with Case Report—Dr. W. G. Schulte.

Hemorrhagic Kidney—Dr. C. J. Albaugh.

Case Report—Dr. C. Klein.

Pathological Specimens (exhibit)—Dr. T. A. Flood.

Several applications for membership in the Association were received by the secretary.

MISCELLANY

From time to time in this department of California and Western Medicine, appear columns grouped under the following headings: Comment on Current and Recent Articles in this Journal; News; Medical Economics; Readers' Forum; California State Board of Health; and California Board of Medical Examiners. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Reapportionment of Delegates to American Medical Association, 1928—The necessity of completed membership returns before April 1, 1928, is emphasized by the following letter from Dr. Olin West:

"Dear Doctor Pope: The last reapportionment of delegates was effected at the seventy-sixth annual session held at Atlantic City in 1925. Another reapportionment will therefore be made at the seventy-ninth annual session of the Association to be held in Minneapolis, June 11-15, 1928. As the reapportionment will be made on the basis of the membership in constituent associations *as that membership has been reported and recorded on the membership records of the American Medical Association on April 1, 1928*, it is important that this office shall have complete reports of the membership of your association so that the names of all members may be duly recorded in this office before April 1, 1928.

This matter is brought to your attention now in order that you may remind the secretaries of your component county medical societies of the need of the fullest possible reports of membership in their respective organizations.

Delegates already elected or to be elected for service in the House of Delegates for the seventy-ninth annual session of the American Medical Association in June, 1928, will be in no way affected by the reapportionment to be made in Minneapolis.

On January 1, 1928, the membership of the American Medical Association, which of course is the combined membership of its constituent state and territorial associations, was 94,238. It is sincerely hoped that this splendid membership will be maintained and even increased by the affiliation of desirable and eligible physicians and that the membership in your state will be maintained at a figure that will insure that there will be no reduction of representation in the House of Delegates.

Very truly yours,

OLIN WEST,

Secretary American Medical Association."

The Clinical and Statistical Section of the Los Angeles County Medical Association has undertaken the publication of the "Daily Program" giving all operations and clinics held in the accredited hospitals of the city. All members of the Association and visiting physicians are invited to attend these clinics. Out-of-town visitors may secure information concerning each day's program through the office of the Clinical and Statistical Section of the Los Angeles County Medical Association, 412 West Sixth Street.

It is the ultimate object of the section to pay particular attention to the compilation of statistics by keeping an accurate report of operations and results.

The dates for the Lane Medical Lectures which are to be given by Dr. F. d'Herelle, Directeur du Service Bacteriologique du Conseil Sanitaire, Maritime et Quarantinaire of Alexandria, Egypt, and discoverer of the bacteriophage phenomenon, have been tentatively fixed for the week commencing October 22, 1928. The subjects of the lectures will be as follows: Bacteriophagy; Bacterial Mutations; The Nature of the Bacteriophage; Infectious Diseases; The Phenomenon of Recovery.

In addition Doctor d'Herelle will give a general lecture at Stanford University on "Logic in Biological Researches."

Annual Meeting of the Northern California Association of Physiotherapists will be held at Sacramento, April 30, 1928, at 2:30 p. m., Room D, Auditorium.

Physiotherapy Procedures in the After Care of Cerebral Hemorrhage—Dr. William Bender, San Francisco.

Passive Motion: Its Place in the Treatment of Stiff Joints—Dr. E. W. Cleary, San Francisco. Discussion, Dr. J. Judson Sale, San Francisco.

Physiotherapy in Relation to Diseases of the Skin—Dr. H. E. Alderson, San Francisco.

The work of the State Department of Public Health in Infantile Paralysis—Demonstration by Miss Winifred Tougas, director.

Popular Lectures at Lane Hall—All interested are cordially invited to be present.

Friday evening, March 9, 1928, 8 p. m.: Protection against Tuberculosis—Dr. Frederick Eberson.

Friday evening, March 23, 1928, 8 p. m.: Prevention of Heart Disease—Dr. William Dock.

The thirteenth annual convention of the Catholic Hospital Association of the United States and Canada and the second annual Hospital Clinical Congress of North America will be held in the Cincinnati Music Hall, Cincinnati, Ohio, June 18 to 22, inclusive, 1928. The fourth annual convention of the International Guild of Nurses will be held at the same time, in the same building, at night meetings.

Outstanding authorities in medicine, surgery, pathology, nursing, dietetics and hospital administration, architecture and engineering, will lecture and demonstrate in specially planned clinics representing the various departments of the modern hospital. A professional program of the highest interest and value is now being formulated, and all persons interested in medical and hospital service are cordially invited to attend. Further information may be obtained from John R. Hughes, M. D., dean of the College of Hospital Administration, Marquette University, Milwaukee, Wisconsin, who is general chairman of the convention and congress.

Conference on Rheumatic Diseases to be held at Bath, May 10 and 11, 1928. President of the conference, Sir George Newman, K.C.B., Hon. D.C.L.; LL.D. M.D., F.R.C.P., D.P.H., Chief Medical Officer, Ministry of Health.

Sessions:

Social Aspects—The Right Hon. Lord Dawson of Penn, G.C.V.O., K.C.B., K.C.M.G., Hon. LL.D.;

M.D., F.R.C.P., physician to His Majesty the King, president.

Causation—Sir Humphry Rolleston, Bt., K.C.B., Hon. D.Sc., D.C.L., LL.D.; M. D., F.R.C.P., physician to His Majesty the King, Regius Professor of Physic, University of Cambridge, president.

Treatment—Sir E. Farquhar Buzzard, K.C.V.O., M.A., M.D., F.R.C.P., physician to His Majesty the King, Regius Professor of Medicine, University of Oxford, president.

Organizing Committee—F. G. Thomson, M.A., M.D., F.R.C.P., chairman; Rupert Waterhouse, M.D., M.R.C.P.; R. G. Gordon, M.D., D.Sc., F.R.C.P.E.; Vincent Coates, M.C., M.A., M.D., M.R.C.P., honorable medical secretary; John Hatton, honorable organizing secretary.

The Hebrew Physician (HaRofeh HoIvree), the only medical journal published outside of Palestine which is written in Hebrew, has just made its initial appearance.

This journal is under the editorship of Doctor Moses Einhorn and Dr. A. Goldenstein. It contains articles on general medical subjects and has a special section devoted to new Hebrew medical terminology. All physicians who are interested in this journal are requested to communicate with the editors, addressing them care of The Hebrew Physician, 286 West Eighty-sixth Street, New York City.

Professor Julius Bauer, professor of medicine in the University of Vienna, and physician-in-chief to the polyclinic, is coming to this country under the auspices of the American College of Physicians, and will deliver several lectures and also the Convocation oration before that body at their next meeting in New Orleans, the 5th to the 9th of March.

He is well known to many American students because of his clinic on endocrinology, which is held in that hospital.

Professor Bauer is not only an interesting personality possessed of an encyclopedic type of mind, but he is also a great student, an admirable teacher, and a splendid lecturer, who speaks English fluently. His coming visit to this country should give many of our physicians an unusual opportunity to learn at first hand his now much-discussed ideas of constitutional pathology and the endocrine glands.

A Nation-Wide Campaign for the Early Diagnosis of Tuberculosis—The National Tuberculosis Association, with its fifteen hundred state and local affiliations, with the support of the American Medical Association and the American Public Health Association, is sponsoring an "Early Diagnosis of Tuberculosis" campaign during the month of March.

The aim of the campaign is twofold: first, to focus the attention of the public at large upon the danger signs of early tuberculosis, and to urge them to go to their doctor for an examination; and second, to stimulate renewed interest on the part of the medical profession in the recognition of early signs of tuberculosis.

The cooperation of every physician in the state is sought to encourage the physical examination of the apparently well during the month of March.

The California Tuberculosis Association, through its executive secretary, Edith Tate Thompson, is prepared to supply upon request very striking public health bulletins and literature on the subject of the importance of physical examination and early diagnosis. This organization will also supply newspaper and other publicity mediums with plenty of material preceding and during the campaign.

Motion pictures for lay audiences entitled "Let Your Doctor Decide," and another for medical groups entitled "The Doctor Decides," will be used throughout the state. Speakers for county medical societies will be supplied on request.

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Volume 1, No. 5, March, 1903

From some editorial notes:

. . . The attention of the members of the State Society is directed to the announcements printed elsewhere concerning the annual meeting to be held in April at Santa Barbara. . . .

. . . As the membership of the State Society now is over one thousand, with some County Society additions to be made between this time and the meeting, the thirty-third annual meeting will bring together representatives from every part of the state, and the exchange of fraternal greetings by members of the profession living in this great empire of California can only be productive of good. . . .

. . . Thieves, scoundrels and patent-medicine fakers have long appreciated the advantage accruing from the association of common interests; but honest men seem as yet to realize it only to a limited degree and trifling extent. . . .

. . . For many years the Register of Physicians in California, formerly published by the secretary of the Board of Examiners, has been a very useful volume. The changes in the state law, together with the retirement of the former secretary, have resulted in the abandonment of the publication of this volume by the Board of Examiners. . . .

. . . It seems to resolve itself into a choice whether it is better to have some money lying idle in the bank or to do something worth the doing, that will be for the benefit of the membership and the profession at large. . . .

. . . In April, 1902, the State Society was reorganized on the plan of county society membership requirement for eligibility to membership in the State Society. . . .

. . . The members of the State Society should certainly take much credit to themselves for their action in recommending that the annual volume of Transactions be abolished and that a journal be substituted. Certainly very few people ever look into an annual volume of transactions, and while some may not study the pages of a journal, or look at it after its volumes are completed, their attention is called to its existence and to the vitality of the society publishing it, at least twelve times each year. . . .

. . . Every physician either is or is not honest and honorable and ethical, so far as the practice of his profession is concerned. If he is honest and honorable in his professional work he should be a member of his local and state society; if he is not, he should not be permitted to join such societies nor to retain his membership in them if he has already joined. . . .

. . . A special committee to investigate thoroughly the proposed plan of the National Bureau of Medicines and Foods (as published elsewhere in this issue), and to report to the House of Delegates at the New Orleans meeting of the American Medical Association, has been appointed by the president, Dr. Frank Billings. . . .

. . . Three bills were presented at the late session of the legislature, the purposes of which were to change, in various particulars, the provisions of the existing law regulating the practice of medicine and

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* This column aims to mirror the work and aims of colleagues who bore the brunt of state society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and recent members.

surgery in this state. One of these bills was not reported back from committee, one was withdrawn, and the other was defeated by vote in the senate, where it originated. . . .

From the minutes of the Sacramento Society:

. . . At the regular meeting of the Sacramento Society for Medical Improvement, held at the office of Dr. W. A. Briggs, on Tuesday evening, March 17, Dr. T. W. Huntington read a paper on "Operative Treatment of Fracture of the Patella." . . .

From a special article by Dr. Emmet Rixford:

. . . Doctor Rixford presented a case of congenital luxation of the hip, showing the final result of Lorenz' operation, performed three years ago, giving the following clinical history: . . .

From a special article by Dudley Tait, M. D., entitled "Treatment of Hydrocele by Eversion of the Tunica Vaginalis (Longuet's Method)." The opening paragraph reads as follows:

. . . Sound therapy is contingent upon precision in diagnosis. A judicious surgical intervention should be preceded by or lead to a positive knowledge of the pathologic conditions present. Hence, the rapid and well-nigh total abandonment, in all branches of surgery, of blind methods of treatment and their supplantation by open procedures. Hydrocele was one of the last ramparts to capitulate, leaving perhaps in its train a few timid camp followers, inert slaves of habit. . . .

From an article on society organization:

. . . Affiliation of county societies continues. Since the last number of the journal was issued the following-named societies have become members of the State Society: Santa Barbara, Placer, San Joaquin, San Diego, Marin, Humboldt, Orange, and Alameda. . . .

From an article entitled "Conservatism in Gynecological Surgery," by Dr. W. F. B. Wakefield, professor of gynecology, Oakland College of Medicine and Surgery. The opening paragraph is as follows:

. . . Desiring to know the general trend of surgical opinion regarding this important subject, I have written to about one hundred of the leading gynecologists of this county, and have been favored with replies from a great many of them, for the courtesy of which I take this opportunity to thank them. . . .

From the correspondence column a letter from T. B. Crothers of Hartford, Connecticut, reads as follows:

. . . Editor California State Journal of Medicine—Dear Sir: Three times during the last half-century medical manifestos have been issued giving the opinion of physicians on alcohol. The first was issued in 1839, and was signed by eighty-six persons. The second in 1847, and was signed by two thousand physicians, and the third appeared in 1871, with the signatures of over four thousand physicians, including the names of many leading physicians in all parts of the world. A fourth declaration of opinions is now being circulated for signatures, and reads as follows: . . .

CALIFORNIA BOARD OF MEDICAL EXAMINERS

By C. B. PINKHAM, M. D.
Secretary of the Board

News Items, March, 1928

Dr. C. E. Camp, 62-year-old San Pablo physician, who admitted misconduct with a half-dozen San Pablo girls, was this morning sentenced to an indeterminate term of from one to fifty years in San Quentin penitentiary by Superior Judge A. B. McKenzie and was taken immediately to the prison.—*Martinez Standard,* January 28, 1928.

According to newspaper reports, Percy Purviance, owner of the Berkeley Chiropractic College, 2168 Shattuck Avenue, Berkeley, has again entered suit, this time asking for an injunction restraining appointment of members to the Board of Chiropractic Examiners. (Previous entries, December, 1925; January, February, June, July, September, and October, 1926; February, 1927.)

Charles L. Conte, a broker with offices in the Gillette Building, 830 Market Street, was arrested early today by Detective Lieutenant Charles Dullea of the Homicide Squad on charges of having violated the Medical Practice Act and having performed a criminal operation on 17-year-old Yvonne Evans, Apartment 1, 2306 Union Street.—*San Francisco Daily News,* January 19, 1928.

According to report, Chester C. Cook, D. C., licensed chiropractor, Watsonville, recently pleaded guilty to a charge of violation of the Medical Practice Act and was sentenced to pay a fine of $600 and serve 180 days in the county jail, sentence being suspended on condition that he hereafter obey the law. "One of his advertisements reads, 'Bachelor of Iridiagnosis, Kritzer School, Doctor of Chiropractic, A. U.N. C. C., Philosopher of Chiropractic, National College, Master of Chiropractic, C. R. S., Ex-president Chiropractic Research Society of Chicago, Licentiate of Tennessee and California. Positively no Palmer methods used.'" (Previous entry, March, 1927.)

Despite his appearance in court dressed in full purple robes of a bishop of his church (Church of Psychosophy), Edwin R. Cook yesterday was found guilty of second degree murder in connection with the death of Mrs. Elizabeth Buckles after an illegal operation. . . . In his testimony Cook tried to shift blame for the woman's death to the shoulders of 'Dr.' Irving Cole, in whose office Mrs. Buckles was found dead last December 21.—*San Francisco Examiner,* February 11, 1928.

A blow would be struck at diploma mills purporting to confer academic, professional or other technical degrees by mail without adequate residence work in the institution by a bill introduced in the Senate by Senator Copeland (Democrat), New York. It provides that nothing shall pass through the mails leading up to or concerning the conferring of such degrees unless the institution or corporation granting or conferring any such degree shall, before the same, is

granted or conferred, prescribe and require of each and every student or other person applying therefor, or proposing to receive such a degree, at least 180 days of actual residence and study at the principal place of business and situs of such institution, in fulfillment of conditions and in preparation for receiving such degree.—*Denver, Colorado, Post,* February 5, 1928.

According to reports, Corbin Dunne of Los Angeles on February 1 pleaded guilty to a charge of violation of the Medical Practice Act and was sentenced to spend sixty days in the county jail, said sentence being suspended for one year.

According to an Associated Press dispatch dated Vienna, January 21, 1928, published in the San Francisco *Bulletin* of the same date, "Medical science has not yet achieved the real regeneration of man, in the opinion of a group of research workers, who spoke at a meeting here attended by about one thousand of Austria's leading surgeons and physiologists. A majority of those reporting declared that the word 'rejuvenation' was a misnomer and that the best that could be said for the gland transplantation operation devised by Dr. Sergei Veronoff was that it afforded transient regeneration. Commenting editorially, the *Bulletin* concludes that, considering Doctor Hoffmeister's study of the Veronoff method of monkey gland transplantation, Hoffmeister's conclusions should serve as a warning to consult the family physician before submitting to any treatment that promises to perform a miracle."

C. J. Jeffers, Los Angeles, is reported to have pleaded guilty on January 25 to a charge of violation of the Medical Practice Act and was sentenced to pay a fine of $100 and serve six months in jail, the fine being paid and jail sentence suspended for two years, on condition that he does not violate the law during that time.

According to press dispatch from Seattle, February 14, printed in the San Francisco *Call* of the same date, Dr. William K. McKibbon, executive secretary of the White Cross, was preparing an appeal to United States Senator Wesley L. Jones for a congressional investigation of the alleged narcotic evil in McNeil Island penitentiary. "Doctor McKibbon declared that the traffic in dope is so widespread within the prison walls that nothing short of an investigation by Congress would produce results. Official guards, trusties and confidential prison employees are among the chief vendors, he alleges. 'I do not believe, however,' the White Cross secretary said, 'that Warden Finch R. Archer himself is cognizant of the extent of the traffic that goes on under his nose. The experience in other prisons, notably Atlanta and Leavenworth, goes to prove that the dope traffic is most insidious and that prison wardens are powerless to stop it.'"

Julio Mancillas, Los Angeles, on January 19, 1928, pleaded guilty to a charge of violation of the Medical Practice Act and was sentenced to one hundred days in the county jail. The records show Mancillas to be an old offender, apparently not at all impressed by a suspended jail sentence given him some time ago. (Previous mention, "News Items," September, 1926.)

According to the San Francisco *Examiner* of February 16, 1928, "'Dr.' Orlando Edgar Miller, San Francisco apostle of health, yesterday expressed his desire to return here and fight the list of charges that survive his Rellimeo Film Corporation. . . . He is charged with using the mails to defraud, embezzlement, grand larceny, and violation of the State Securities Act. . . . Federal authorities declare that at least two East Bay women victims have been defrauded through Miller's scheme to uplift the movie industry through the defunct Rellimeo Film Company. . . . Miller ascribed his troubles to the American Medical Association, which he said had 'constantly persecuted me because of my theories on health.'" (Previous entries, June, October, November, 1926; March, 1927.) (Nostrums and Quackery, first edition, p. 115; second edition, p. 40.)

Dissatisfied by the failure of operatives of the District Attorney's office to serve a warrant issued for Deputy District Attorney Louis M. Powell, Superior Judge Charles S. Burnell issued a second bench warrant yesterday and turned it over to the sheriff's office. Powell is sought for having abandoned the prosecution of Dr. Charles O. Mount, charged with murder and convicted of manslaughter. . . . Powell introduced the prosecution's evidence January 30 and then disappeared. When he failed to appear the next day an adjournment was ordered and the case continued. February 1, Powell was still absent, and Deputy District Attorney Clifford Crail was assigned to continue the prosecution. Judge Burnell ordered Court Clerk E. E. Ekdale to issue a bench warrant for Powell, and the warrant was turned over to two operatives of the District Attorney's office. When Judge Burnell learned yesterday that, after a search of more than a week, the District Attorney's operatives had failed to locate Powell, the jurist issued a new warrant to be served by deputies from the sheriff's office.—*Los Angeles Illustrated Daily News,* February 10, 1928.

Dr. C. H. Rice, a graduate of the University of Minnesota and recently a practicing physician in San Francisco, has been named resident surgeon of the Oakland Emergency Hospital. . . .—*Oakland Tribune,* February 7, 1928.

"Found guilty of violating the California Chiropractic Act, which prohibits a licensed chiropractor from using the title of 'Dr.' without specifying 'Doctor of Chiropractic.' J. Douglas Thompson, 1624 Franklin Street, was fined $50 recently by Police Judge Edward J. Tyrrell. Thompson, arrested on complaint of George M. Wynn, inspector of the State Chiropractic Board, gave notice he would appeal to the Superior Court." It is reported that J. Douglas Thompson formerly broadcast health talks over KTAB, Oakland, on Tuesday evenings.

Brought back here from his mother's home in Buffalo, New York, after a 4000-mile flight, Charles van Dickeson, alias "Dr." Irwin A. Cole, today was held in the Oakland city prison in connection with the death a month ago of Mrs. Betty Buckles, 22, victim of an illegal operation. He has confessed, according to the police, and is expected to plead guilty to a charge of second degree murder. . . . The fake physician admitted, police said, having made Josephine Risius, his nurse, victim of a fake marriage last year. . . . Dickeson, army deserter and former convict, was one time office manager for an Oakland physician and obtained his inspiration at that time for enacting the rôle of a doctor. He declared that Bishop Cook performed several operations for him. He said he himself performed two, both successful.—*San Francisco Bulletin,* January 23, 1928. (Previous entry, February, 1928.)